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BrightStor Storage Portal

Function: Offers a single view for managing storage installations

Date: March 8

Shipment: Midsummer

eTrust Security Portal

Function: Offers a single view for managing online security processes

Date: Undetermined; demo planned at CA World next month

Shipment: Undetermined

Quick Link To access recent coverage of CA, visit our Web site: www.computerworld.com/q/?a1940

CA Confronts User Anger, Reveals Web Portal Plan

Kumar talks candidly about Computer Associates' hard-nosed reputation, says CA will introduce portals for security and storage management at CA World

BY MARC L. SONGINI, DON TENNANT AND MARYFRAN JOHNSON
ISLANDIA, N.Y.

Last week at Computer Associates International Inc.'s headquarters here, President and CEO Sanjay Kumar spoke at length with *Computerworld* about CA's historically stormy relationship with its customers and the recently initiated federal investigations into changes CA has made in its financial accounting and reporting practices. Excerpts from that interview follow:

SANJAY KUMAR, CA's president and CEO

In light of the problems CA has confronted over the past year, what are you going to tell your users at this year's CA World? There has al-

Kumar, page 61

BY MARC L. SONGINI
ISLANDIA, N.Y.

Computer Associates International Inc. is preparing to ease the pain for users running heterogeneous storage and security management applications. And CA says it will do so without forcing them to buy into its Unicenter enterprise systems management platform.

CA WORLD

Executives last week told *Computerworld* that CA is readying the rollout of stand-alone Web portal software for centralized storage and security management. The plan will be detailed at the company's annual user conference next month. CA also plans to make announcements at CA World regarding its relationship with its customers, but company officials didn't elaborate beyond conveying a strategic direction (see Q&A at left).

CA World, page 61

MAINFRAME SKILLS, PAY AT A PREMIUM

Experienced workers nearing retirement age

BY JULIA KING

IT managers looking to cut labor costs during the ongoing recession might want to think twice before laying off any of their workers who have mainframe or data center skills.

With mainframe shipments on the rise and legions of traditional mainframe IT workers nearing retirement age, technology managers last week said it's becoming increasingly difficult and costly to replace employees who have deep experience in Cobol, CICS and other mainframe technologies.

For example, the Workplace Safety and Insurance Board of Ontario is shelling out 10% to 15% signing bonuses to new workers with mainframe skills. The Toronto-based board, which oversees workplace safety and workers' compensation issues for the province of Ontario, also pays "hot skills" premiums to mainframe experts. That can boost their annual salaries by as much as 10%, said David Londry, director of the board's corporate information center.

At the Automobile Club of Southern California, a Costa Mesa, Calif.-based affiliate of Heathrow, Fla.-based AAA (formerly known as the American Automobile Association), IT manager Bill Reini said he's

Mainframe Skills, page 16

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What Have You Done For Me Lately?

CEOs and CFOs are continually asking their IT leaders to come up with brilliant ideas for slashing costs, pumping up sales or improving productivity. Here's a look at three hard-chargers who have delivered. Stories begin on page 28, and also see related editorial, page 24.

AT ONE TIME, DATA STORAGE AND AT ONE TIME, THIS

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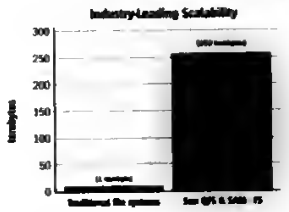

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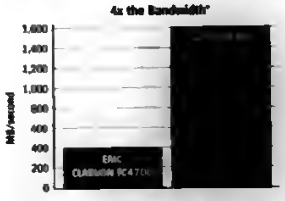

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Sun microsystems

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MONICA MELNYCHUK

MIND YOUR MANNERS

This week's QuickStudy topic is netiquette, or how we should behave when we're communicating over the Internet. PAGE 48

JENNIFER ZIMGA

SMOOTH SAILING

When Tom Murphy (left) arrived as CIO at Royal Caribbean Cruises in April 1999, he inherited an IT department that was in disarray. Opposing "mafias" controlled the data center and networking groups, and the business units had no confidence in IT. Two years later, everything has changed. PAGE 30

MARCH 4 2002

COMPUTERWORLD THIS WEEK

NEWS 6

SPECIAL NEWS REPORT

SEPT. 11: After Six Months, IT Is Key

6 Those spearheading IT volunteer efforts never want to be caught off guard again.

7 Wall Street firms begin moving their IT operations out of Manhattan to avoid a recurrence.

8 Critical infrastructure protection becomes a top priority for the public and private sectors.

10 Corporate privacy managers acknowledge that they have a long way to go to get privacy policies in place and to ensure compliance.

12 Microsoft is filling a glaring midmarket hole by moving into the CRM space, say analysts.

14 Attendees at last week's BEA user conference receive promises of more tightly integrated middleware products.

BUSINESS 27

27 Paul A. Strassmann says many methodologies aimed at calculating the alignment between IT and business units don't add up.

36 DiversITy: Women in IT who bump up against perceived gender barriers typically take one of two approaches to the problem, writes Kathleen Melymuka. They either whine about them or see the barriers as challenges and fight to overcome them.

38 Career Adviser Fran Quittel offers advice to an IT professional who is preparing for a layoff and to a veteran mainframe programmer who has updated his skills in areas such as Visual Basic and Java but has had trouble getting in the door at other companies.

38 Workstyles: Phil Go, CIO at Barton Malow Co., talks about what it's like to work in IT at the $1 billion construction management firm.

TECHNOLOGY 39

39 Nicholas Petreley takes a skeptical look at the impact on Web services from Microsoft's .Net initiative.

40 Field Report: Network-attached storage is becoming a serious top-down enterprise storage resource.

44 Emerging Technologies: The iSCSI standard is paving the way for IP-based storage-area networks, and the new standard will battle with Fibre Channel for data center supremacy.

46 Hands On: Virtual machines that can concurrently host multiple operating systems may dramatically reduce your backup equipment and software costs.

50 Security Journal: A token-based access system proposed by Mathias Thurman faces opposition from the network engineers at his company.

OPINIONS 24

24 Patricia Keefe says that IT professionals are being called upon to do things that are heroic — be it at work or in their communities. The big question for this year is: What have you done for me lately?

24 Pimm Fox writes that enterprise portals can help the bottom line, but they aren't integration tools, and they require clear, goal-oriented planning.

25 David Foote contends that, amid the Enron fallout, the only way to enforce ethical behavior is to hire the right people.

62 Frank Hayes says a "best practices" proposal — for telling a software vendor of a product security flaw and giving the vendor time to fix it — is itself flawed.

Editorial/Letters 24, 25
How to Contact CW 60
Company Index 60
Shark Tank 62

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ONLINE

NAS TIPS

After reading our Field Report on network-attached storage on page 40, go online for NAS installation tips and an extensive resource list.
www.computerworld.com/q?a1610

COULD LINUX RULE?

If Microsoft falls off its operating system peak, does Linux have what it takes to become the desktop operating system of choice? Post your thoughts and read what others have to say in our forum.
www.computerworld.com/q?a1630

A CASE FOR CLOSED SECURITY

Now that Microsoft has vowed to improve the security of its products, it should trade its security add-ons and afterthoughts for a new philosophy based on a closed security model, *Computerworld* editor Robert L. Mitchell writes in our security community.
www.computerworld.com/security

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Efforts Afoot to Coordinate IT Volunteer Work After Disasters

Many tech needs yet to be addressed

BY MELISSA SOLOMON

AFTER recovering from the shock of Sept. 11, Julie Gandle decided to do her part to aid the recovery efforts.

She told a Park Avenue emergency relief center volunteer that she had 18 computers and two weeks of man-hours to donate from her New York-based IT infrastructure support firm, Work Friendly Solutions. "The poor woman looked at me and said she didn't even know how to use a computer," said Gandle.

As the devastation of Sept. 11 unfolded, IT professionals worldwide recognized the data and iofrastructure implications and stepped forward to offer their expertise. But while relief agencies were ready with food, shelter and counseling services, no one seemed to be prepared to harness the collective IT manpower and put it to systematic use.

"You would think in New York City 2001 that there's a whole portable unit that can drop down in two hours with PalmPilots. That doesn't happen," Gandle said.

Within weeks, a few groups emerged to lead the business and IT recovery efforts. With help from thousands of volunteers like Gandle, they accomplished a great deal. But six months later, many feel that much more could have been done. So IT and business leaders are now streamlining their efforts to tackle long-term needs and ensure that they're never caught off-guard again.

AS NEW YORK recovers from the attacks, efforts are under way to better

"It was chaos," said Maria Gotsch, director of Restart Central, an organization jointly operated by the New York City Partnership and the city and state economic development offices to channel donated goods and services to businesses affected by the attacks. "We had every problem, every situation that a start-up has."

John Williamson, a laid-off IT worker, said he tried unsuccessfully to volunteer. "We should have had some direction, some leadership," said Williamson, who created one of many Web sites compiling volunteer opportunities. "But when you tried to step up to the plate, you got pushed aside. It seemed politics stepped ioto it pretty quickly."

Relief coordinators said the volume of assistance was heartening, but the offers of help far exceeded the demand. And in the first few months after Sept. 11, their attention was focused on helping those with emergency needs.

But "there are still needs," said Barbara Chang, executive director of NPower NY, a nonprofit organization that provides IT assistance to other nonprofits in the city.

A February update to a study commissioned by the New York City Partnership in November found that the economic impact from the attacks is meeting initial projections of $83 billion in damage to the city's economy.

Many businesses are starting to move into permanent office space, build up their long-term infrastructures and apply for grants and loans, said Ronna Brown, president of The Better Business Bureau of New York, which held forums in November and January to coordinate relief efforts.

To address long-term planning, Ron Wyden (D-Ore.), chairman of the Senate Subcommittee on Science, Technology and Space, has been working to create a national emergency technology guard. His plan is to form a chain of command to coordinate the science and technology sectors to prevent and respond to disasters.

"There was such an outpouring of support," said Wyden's press secretary, Carol Guthrie. "Even more might have been accomplished if there was a clear organizatioo in place."

Businesses affected by the attacks or those who would like to volunteer or donate equipment to businesses in need can complete an NPower NY relief form at www.npowerny.org/Index_re.html *or contact Restart Central at (866) 227-0458 or* www.restartcentral.org.

A Push for One Voice

Among the log of events after Sept. 11, one phone call stands out for James Paddon, chief financial officer at Lava Trading Inc., a trading-floor software firm that was on the 83rd floor of 1 World Trade Center.

The call was from from a woman at Restart Central, an organization created to help businesses rebuild after the attacks. Since then, Paddon has worked with Restart Central volunteer Alison Burke to line up office furniture and equipment and re-establish telecommunications networks. "It's really been a tremendous resource for us," said Paddon, who's still working with the organization.

Restart Central has matched more than 1,000 businesses with $3.2 million worth of donated goods. It's still working with about 340 firms, said Maria Gotsch, the organization's coordinator.

Volunteers offered assistance to those who contacted city and state emergency hot lines or walk-in centers. They gathered donated resources and entered the names of volunteers and affected companies into a database. They then assigned qualified volunteers to work individually with businesses to rebuild their infrastructures, explained Burke.

Julie Coppernoll, technical assistant to the chairman of Intel Corp., testified about her experiences with Restart Central at a December Senate hearing to create a national emergency technology guard. Coppernoll said she felt the "one-voice concept" made sense.

"[Restart Central was] definitely a leader. There's no question about that," she said.

– Melissa Solomon

How IT Pros Helped Out

It took three tense days for TripleHop Technologies Inc., an enterprise search-and-retrieval software firm that was on the 53rd floor of the World Trade Center, to learn that all of its employees were safe and accounted for.

Then TripleHop's managers turned their attention to the business. Thanks to its backup site, the firm restored its e-mail server almost immediately, and it lost only about a month's worth of software development work, said Chief Technology Officer Joaquin Delgado. But all of its equipment was gone.

Fortunately, word of IT donations and volunteers spread quickly. Several organizations, including *Computerworld*, created volunteer databases and passed names along to relief agencies assisting affected businesses. Since January, those who volunteered through *Computerworld*'s database have been sharing stories about how they helped out.

Shortly after TripleHop moved into its new space on West 25th Street, it connected with New York-based About Inc., which gave TripleHop several computers, a fax machine, a printer and even a microwave.

"They were perfect for our needs," said Delgado. "Without those computers, we would have lost a lot of business."

About, which runs an online information network, also donated spare space in its offices and gave free phones and Internet connectivity to W-technologies Inc., a wireless business left homeless after the attacks, said Luc LaFontan vice president of corporate technology at About.

"The best way you can fight against what happened is to be on your feet again [and] to get the economy going again," Delgado said.

– Melissa Solomon

Quick Link For more stories from IT pros who volunteered after Sept. 11, visit our Web site: www.computerworld.com/q/72764

Financial Firms Plan Widely Dispersed IT Operations

Aiming to avoid big losses, some move out of Manhattan

BY LUCAS MEARIAN
NEW YORK

In the wake of the Sept. 11 attacks, financial services executives are putting more stock in employees' ability to work from remote locations using virtual private networks, and they're widening the gap between office locations to mitigate the impact of future disasters.

In some cases, that means companies are moving their offices and IT operations out of New York City and into surrounding suburbs.

Merrill Lynch & Co., for instance, is moving its primary data center from Manhattan to Staten Island, which is on a different power grid, according to Marvin Balliet, first vice president and chief financial officer of the firm's technology group.

Another big Wall Street firm that'a pulling up at least some of its stakes is Morgan Stanley Dean Witter & Co., which was in the process of completing a new 1 million-square-foot office tower in New York last year but sold the 32-story building to Lehman Brothers Holdings Inc. in October.

Instead, Morgan Stanley announced plans in January to purchase the former Chevron-Texaco Corp. headquarters in Harrison, N.Y., about 27 miles nortb of its current offices.

Gregory Ferris, executive director of global business continuity planning at Morgan Stanley, said the threat of future attacks was the primary reason for the bank's change of heart.

"We need to be able to react to a disaster... but more important is we need to mitigate the loss of a single site," said Ferris, one of the speakers at the Securities Industry Association's Internet Trends and Strategy Conference held here last week.

With its primary spaces at 1585 Broadway and 745 Seventh Ave., the firm'a trading and backup facilities would be concentrated in two buildings located within a city block of each other and dependent on the same transportation and power infrastructures.

Ferris added that an expansion in so-called dark fiber networks — optical fiber networks that aren't currently being used — is making the decentralization of staffs' and data centers easier today because of increased bandwidth.

William James, chief technology officer for Bank of America Corp.'s broker/dealer services unit, said his company is implementing a dark fiber network to connect data centers in California, Texas, North Carolina and New Jersey in a two-year, multimillion-dollar project he expects to be completed sometime next year. The network will he used for disaster recovery as well as backups.

Currently, Bank of America uses leased T3 lines at a "substantial cost" to load-balance servers among data centers for disaster recovery.

"There's a one-third reduction in cost by [using disaster recovery servers for load balancing] vs. having all your disaster recovery boxes in the same data center. They're there just as space heaters that aren't being used," James said.

We need to be able to react to a disaster ... but more important is we need to mitigate the loss of a single site.

GREGORY FERRIS, EXECUTIVE DIRECTOR, GLOBAL BUSINESS CONTINUITY PLANNING, MORGAN STANLEY

Wall Street Seeks Cyberterror Defenses

HACKER WATCH

The most effective way to deal with the twin threats posed by hackers and cyberterrorists, say many Wall Street IT executives, is to form a unified effort between the private sector and government to create a central communications platform to alert and disseminate information about such attacks using a private Web site.

A panel made up of representatives from the U.S. Secret Service, the National Infrastructure Protection Center and the Financial Services Information Sharing and Analysis Center (FS/ISAC) promised attendees at a Securities Industry Association cyberterrorism workshop in New York last week to work toward sharing information within the financial industry and with law enforcement about probes and attacks on firms' technology infrastructures.

The FS/ISAC, a private organization in New York, charges companies a minimum $7,000 annual fee for alerts and access to information about hacking and cyberterrorism threats. Stanley Jarocki, vice president of IT security engineering at Morgan Stanley Dean Witter and chairman of the FS/ISAC, said cyberterrorists supported by governments have almost unlimited resources to do damage to Wall Street's IT infrastructure.

Jarocki said firms should either join the FS/ISAC's service or create a secure, central Web site through which they can share information anonymously with one another.

C. Warren Axelrod, director of information security at the Pershing Division of Donaldson, Lufkin & Jenrette Securities Corp. in Jersey City, N.J., pointed out that the greatest cyberterrorism threats come from "someone infiltrating your organization and using that power to do damage."

"The way firms can protect themselves is to share the information with each other without broadcasting it," Axelrod said.

Bob Weaver, an agent of the Secret Service's New York Electronic Crimes Task Force, agreed. He said almost 70% of the more than 900 people the Secret Service has arrested in New York in connection with Internet attacks are considered insider threats. He recommended that companies adopt background checks for employees based on the sensitivity of an individual's position within the organization.

"On the backside of this is negligence suits by insurance companies based on the fact that you didn't have due diligence or best practices in place," Weaver said.

– *Lucas Mearian*

Lasers Eyed as Medium for Disaster Communications

BY LUCAS MEARIAN
NEW YORK

Companies near ground zero in New York learned some painful lessons in the aftermath of the Sept. 11 attacks, not the least of which is how to communicate when telephone lines and Internet service providers are down.

One answer was in the 14th-story window of the lower Manhattan headquarters of financial services law firm Cadwalader, Wickersham & Taft on that fateful day: a small black box that emits a laser beam transmitting data at IG bit/sec. to a secondary office site across the street.

After the terrorist attacks, New York-based Verizon Communications' phone and data lines running under the World Trade Center were cut and couldn't be rerouted for days. Meanwhile, Cadwalader's laser beam kept transmitting documents, financial information and e-mails — at least when employees were allowed to use their computers when generators were the sole source of power.

The laser beam "kept working, even through all the smoke and ashes from the fallout," said Greta Ostrovitz, Cadwalader's director of technology. "Had we put in telephone lines with similar speed, it would have cost us $6,000 per month. This [laser] cost us $48,000 one time."

The laser was installed three years ago by manufacturer LightPointe Communications Inc. in San Diego. LightPointe's laser systems provide campus-like networking for distances spanning about 2.5 miles in metropolitan areas and speeds ranging from about 2M bit/sec. to 622M bit/sec.

"Maybe once or twice a year we adjust the alignment, but that takes two or three minutes," Ostrovitz said. "It is virtually flawless."

The system allows all types of networking protocols — including Synchronous Optical Network ring closures, Gigabit Ethernet access, DS3 services and Gigabit Ethernet LAN-to-LAN — to be transmitted at full networking speeds.

OSTROVITZ: Laser beam transmitted data despite surrounding debris.

In addition, the laser systems can be deployed in a matter of hours without the need for a long-term, leased wired or fiber connections.

Merrill Lynch & Co. has set up a similar data-transmitting laser pointing from its Vesey Street office towers across the Hudson River to an alternate site in New Jersey. Merrill Lynch spokeswoman Selena Morris said the laser was installed in direct response to losing communications on Sept. 11.

Digital Destruction Was Worst Imaginable

Extent of cyberinfrastructure devastation on Sept. 11 unprecedented, officials say

BY DAN VERTON
WASHINGTON

FOR SEVERAL tense hours on Sept. 11, the nation was deaf, dumb and blind due to the "absolutely massive" loss of communications infrastructure resulting from the collapse of the World Trade Center, a senior government official said last week.

While those losses pale in comparison to the human tragedy, federal and industry officials for the first time painted a frightening picture of what the terrorist attacks did to the U.S. telecommunications infrastructure that fateful day and revealed just how fragile the nation's economic digital backbone can be.

According to officials at the homeland security conference here last week, sponsored by the Fairfax, Va.-based Armed Forces Communications and Electronics Association, the collapse of the World Trade Center towers in New York inflicted severe damage on one of the most critical telecommunications nodes in the country: the main regional switching center operated by Verizon Communications at 140 West St., adjacent to World Trade Center 7, which collapsed.

The resulting devastation was "the most significant challenge that the National Communications System had ever seen," said Brenton Greene, deputy manager at the National Communications System (NCS), which is responsible for all the major telecommunications networks that have national security significance.

In addition to the immediate wireless circuit overload, the collapse of the towers sent a massive steel beam slicing through a bundle of critical fiber cables buried eight feet below ground, destroying more than 4 million high-speed access lines and rupturing water lines that filled underground switching vaults with more than 10 million gallons of water.

The damage knocked out 1.5 million circuits that served the financial district, threatening the country's economic stability, said Greene.

The Verizon facility housed enough equipment to make it the "most communications-intensive area in the U.S.," said Bruce Fleming, divisional technology officer at New York-based Verizon.

Virtual Army Fights Back

That fact wasn't lost on the Bush administration, Greene said. Once emergency response and rescue efforts were given the support they required, the White House ordered Greene to make restoring Wall Street connectivity the next priority.

Restoring the Verizon backbone, however, would require a virtual army of federal and industry technicians. Primary power had been lost, and backup power, which was running on diesel fuel generators, began to fade quickly.

Lucent Technologies Inc. in Murray Hill, N.J., one of Verizon's main systems providers, rushed a 100,000-line switch to the scene to replace another massive switch that had been sent crashing through the window of the Verizon building. The company also put all of its customer requirements on hold and made its entire inventory available to rescue services, said Greg Butler, a Verizon vice president who coordinated incident response efforts.

In addition to the damage incurred by Verizon, at least 139 fiber rings in surrounding buildings and 26 building-specific fiber rings failed, said Dick Price, vice president of field operations at WorldCom Inc.

"From a macro level, our national security should be a major part of our telecommunications policy," said Fleming. "If it can happen, it hasn't happened yet."

Lessons Learned From the Trenches

Consider how you will get replacement supplies, equipment and personnel to disaster sites when planes can't fly, bridges are closed and other transportation is unavailable.

Eliminate single points of failure. Nasdaq avoided interruption in operations by distributing transaction nodes.

Distribute storage and backup data, especially configuration information.

Water Systems Improve Net Security After FBI Warning

Wireless systems vulnerable to jams

BY BOB BREWIN

Following an FBI terrorism alert issued in January, municipal and publicly owned water systems around the country have started to boost the security of wireless data systems that control their distribution networks.

The FBI's National Infrastructure Protection Center didn't publicly release the contents of the warning, but water utility executives confirmed that they were alerted that Osama bin Laden's Qaeda terrorist network had extensively researched their systems on the Web.

Utilities, including water systems, use wireless Supervisory Control and Data Acquisition (SCADA) networks to control all aspects of their distribution systems, such as electric transmission lines and substations, water pipelines, storage tanks and pumps. These networks can control myriad pumps, pipelines and reservoirs in a large water distribution system.

Jill Lyon, general counsel of the Washington-based United Telecom Council (UTC), which represents the telecommunications interests of utilities with federal regulatory bodies, said her organization has met with the Office of Homeland Defense and other agencies to discuss potential vulnerabilities in SCADA systems.

Lyon said one of her biggest concerns is the potential jamming of wireless SCADA systems, which operate in the 900-MHz frequency band. She said SCADA systems in that band, which is also home to cellular systems, cordless phones and unlicensed fixed wireless operators, are already subject to unintentional "harmful interference" from authorized users in the band. Because of those issues, she is concerned about the ability of an adversary to intentionally jam SCADA networks, she said.

Such jamming could potentially allow a foe to turn pumps on or off, "start a fire and then shut down the water system," depriving firefighters of the water they would need to combat the fire, Lyon said.

Jerry Obrist, UTC chairman and chief engineer for the Lincoln Water System in Nebraska, said he, too, is concerned about wireless SCADA systems operating in bands allocated to the utility industry.

Obrist said water utilities might eventually be forced to encrypt all data on their SCADA systems and may have to consider shifting their SCADA networks to private fiber-optic systems, which are less susceptible to jamming or hacking than wireless networks. Obrist said water utilities also need to remove all information about SCADA systems from publicly accessible Web sites to prevent the kind of intelligence-gathering the FBI warned about.

Sheila Strehle, a spokeswoman for city-owned Seattle Public Utilities, said that in the past few months, the department has removed all information about SCADA systems from its Web site, as well as maps detailing the water system's infrastructure and details of certain capital spending projects. It currently operates what Strehle described as a "low-tech" SCADA system but is developing a network with increased security requirements.

Investor-owned San Jose Water Co., which serves Silicon Valley, has also added security upgrades since September to its wireless SCADA network, said spokesman Dick Balocco.

AT A GLANCE

SCADA Security

- FBI warns of Web research by Osama bin Laden's Qaeda organization into water company data networks.
- Wireless SCADA networks are susceptible to jamming.
- Some Web sites contain maps of distribution systems and SCADA networks.
- Costly private fiber-optic nets could help resolve wireless security problems.

Quick Link: For more on the role of technology when disasters hit, visit our Web site: www.computerworld.com/s/727060

Quick Link: To learn more about SCADA networks, visit our Web site for links to resources: www.computerworld.com/s/727704

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AT DEADLINE

Microsoft, DOJ Revise Antitrust Settlement

Microsoft Corp. and the U.S. Department of Justice (DOJ) revised their proposed antitrust case settlement in advance of a court hearing scheduled for Wednesday. Most of the changes were intended to better define terms and to close potential loopholes. Microsoft also agreed to delete a clause that critics claimed could have given it access to technology patented by PC vendors.

Galileo Moves Fare Pricing App to Unix

Parsippany, N.J.-based Galileo International Inc., which operates one of the four major travel reservation systems, said it's moving its fare-pricing application from a mainframe to a group of eight Sun Fire 6800 Unix servers made by Sun Microsystems Inc. Galileo also plans to rewrite the software as part of the switch. The Unix-based setup is already being used by some of Galileo's customers.

Security Hole Found In Linux Firewall

Linux developers warned that a flaw in the Netfilter firewall used in various versions of the open-source operating system's kernel could leave servers vulnerable to attack. Red Hat Inc. in Research Triangle Park, N.C., released a patch to plug the hole in Versions 7.1 and 7.2 of its Linux distribution. A separate patch is available at *www.netfilter.org*.

Short Takes

Sunnyvale, Calif.-based Web development and hosting firm LOUDCLOUD INC. agreed to buy Los Angeles-based FRONTERA CORP. in a stock-swap deal . . . Southfield, Mich.-based COVISINT INC. signed up Plano, Texas-based ELECTRONIC DATA SYSTEMS CORP. to provide technical support to users of its business-to-business exchange.

Corporate Privacy Credibility Crumbles

News of questionable practices and security gaffes puts firms on the defensive

BY PATRICK THIBODEAU
WASHINGTON

Christopher Fisher, information systems director at Royal Appliance Manufacturing Co., agrees with a recent Harris Interactive Inc. poll that found that a majority of the public is mistrustful of corporate privacy practices and wary about sharing information. And he's doing something to address this trust problem.

This past weekend, Fisher's company, the Glenwillow, Ohio-based maker of Dirt Devil vacuum cleaners, planned to launch a redesigned Web site that changes its data collection practices. Instead of asking for more customer information, Royal Appliance will ask for less. For instance, it will seek a customer's ZIP code instead of an address to help locate a local product supplier.

"The main thing we want to do is keep the site accessible and useful to the broadest array [of customers] possible but still provide value to people," said Fisher. By taking a minimalist approach to data collection, he hopes customers will be more comfortable using the company's Web site and sharing personal information.

What Royal is doing may not be so unusual. Corporate privacy managers and experts have said that companies must do more to bridge a consumer privacy credibility gap that is showing signs of widening.

The most recent piece of evidence of customer mistrust was offered in a poll conducted by Rochester, N.Y.-based Harris Interactive for Privacy & American Business, a nonprofit think tank in Hackensack, N.J.; Ernst & Young International in New York; and the American Institute of Certified Public Accountants in New York. The poll of 1,529 adults found that 75% believed that their information would be shared without their permission, and 69% felt that hackers can steal their data.

"I believe the trust gap that [the pollster] found is real," said Mel Petersen, chief privacy officer at Cincinnati-based Procter & Gamble Co.

Long before the Harris poll, Proctor & Gamble took steps to reinforce consumer confidence by implementing a plain-language privacy policy, privacy seal certification, companywide privacy training and an internal audit program and by allowing consumer choice on the use of such data, said Petersen. He added that large corporations with good privacy practices can suffer collateral damage from the privacy mistakes of others, which is why he is working with other companies and privacy groups to raise industry standards.

"If there were to be some egregious [privacy] violations, things could very quickly go sour, even for us," he said.

Experts and corporate officials don't have to look too far for a list of causes of consumer mistrust, such as the rise in identity theft, unsolicited commercial e-mail or spam, and telemarketing.

Just last week, The New York Times Co.'s intranet was breached by a security consultant, exposing subscriber names, addresses, phone numbers and even Social Security numbers.

Getting a Seal of Approval

One company, Expedia Inc., said that strong privacy practices give it an edge with the public. The Bellevue, Wash.-based online travel service has received two privacy certifications from seal organizations, Truste, a nonprofit group in San Jose, and BBBOnLine Inc., a subsidiary of the Council of Better Business Bureaus Inc. in Arlington, Va.

Expedia also displays an auditing seal from PricewaterhouseCoopers, which compared privacy and security practices with Expedia's actual privacy policy. PricewaterhouseCoopers and Deloitte & Touche LLP, both based in New York, also conduct penetration testing for Expedia.

While these extra steps are costly and time-consuming, "we believe it provides a competitive advantage," said Tony Gonchar, Expedia's customer relationship management and privacy director.

But in the post-Enron environment, even using an independent auditor raises issues. John Featherman, privacy manager at The Reynolds and Reynolds Co. in Dayton, Ohio, advised firms to avoid potential conflicts by not using their own financial auditors for internal privacy audits.

The Roots of Mistrust Go Deep

IT managers can do a perfect job of managing privacy but still be penalized by consumers for other companies' lapses. It's like boot camp: Even if just one soldier messes up, everyone may be told to do 50 push-ups.

The privacy mistakes of a few companies can affect an entire industry. But some corporate managers are also seeing feedback stemming from unrelenting trends, such as identity theft and rising volumes of spam.

The overall environment is "less trusting today . . . than it was a year ago, and that's the cumulative effect of consumer experience," said Kristin Valente, an assurance partner at Ernst & Young. "If businesses are going to be successful, they are going to have to turn that tide . . . to embrace what consumers want."

An e-mail poll last summer by The Gallup Organization, a think tank in Princeton, N.J., found that 80% of 400 users said they are "very concerned" or "somewhat concerned" about misuse of credit card data on the Internet. An oft-cited study by Cambridge, Mass.-based Forrester Research Inc. estimated that total online spending of $47.6 billion last year would have been $15 billion higher if not for privacy concerns.

Identity theft may be partly to blame. The U.S. General Accounting Office recently surveyed three credit reporting agencies and found that identity theft increased 36% from 1999 to 2000, based on the number of fraud alerts (89,000 in 2000) placed on customer records.

Spam isn't helping either. The average in-box received an estimated 700 unsolicited commercial e-mail messages last year, a figure that's expected to double by 2006, according to Jupiter Media Metrix Inc. in New York.

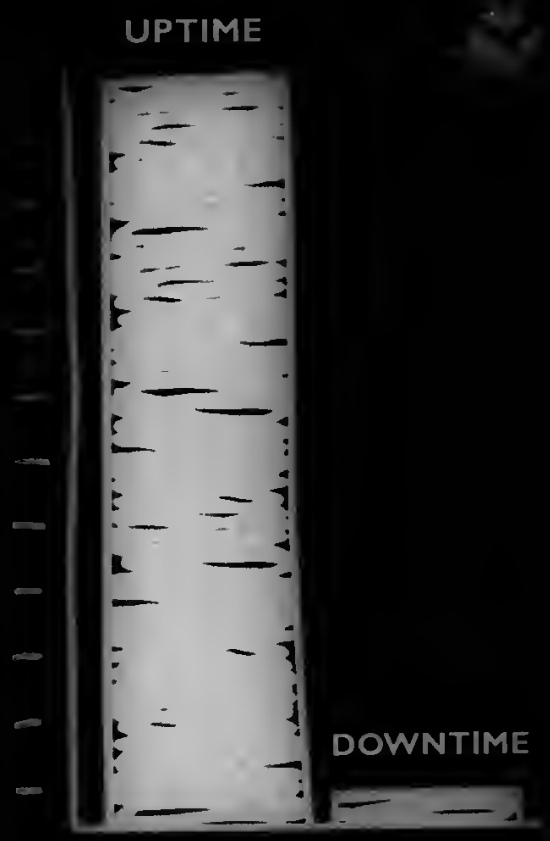
When asked what companies can do to fix the problem, respondents to the Harris Interactive poll picked independent verification as their top choice. That pick "is a warning" to managers that what they are doing "is not persuasive to the American public," said Alan Westin, founder of Privacy & American Business.

– Patrick Thibodeau

What's IT to Do?

If more firms follow good privacy practices, consumer confidence may increase, say experts and managers. Here are some things they say IT can do:

1. Post an easy-to-understand privacy policy.
2. Obtain privacy seal certification.
3. Get an independent audit.
4. Collect only the customer data you need.
5. Give consumers choices.



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Microsoft Stepping Into CRM Market

It's developing software aimed at midsize firms through its Great Plains Software unit

BY CAROL SLIWA

MICROSOFT'S expansion strategy extended to the business applicatioos space last week, wheo the company announced plans to offer customer relatioooship management (CRM) software.

The software maker also recently confirmed its intention to explore new offerings in enterprise storage and security, even going to the extent of creating business divisions devoted to those areas.

Microsoft Corp.'s foray into CRM will be executed through its Great Plains Business Solutions group, which specializes in business management applications for small and midmarket companies. Microsoft completed its acquisition of Fargo, N.D.-based Great Plains Software Inc. in April of last yea·

Microsoft's new CRM offering, which is due to ship in the fourth quarter, is aimed at companies with 25 to 1,000 employees, according to senior product manager Holly Holt. She said customers will have two ways to enter the product: through Outlook mail clients or through Internet Explorer browsers.

Big Impact

"It could certainly have a huge impact and really open op the lower end of the market for smaller-size to medium-size businesses," said Mary Wardley, an analyst at IDC in Framingham, Mass. Many of those firms have Microsoft infrastructures and use Outlook, she noted.

Jim Prevo, CIO at Green Mountain Coffee Roaster Inc. in Waterbury, Vt., an Exchange Server and Outlook user, said he sees the product as a potential "logical add-oo" for his company. "We'd have to integrate it with our ERP back end, but it is worth a look," he said.

Analysts said they doo't expect Microsoft to take oo the enterprise CRM offerings from vendors such as Siebel Systems Inc., SAP AG, Oracle Corp., PeopleSoft Inc., Onyx Software Corp. or Pivotal Corp. in the foreseeable future.

Microsoft's product has only hasic functionality compared with the feature-rich sales, customer service and marketing automation capabilities of the software from the major players, said Joe Outlaw, an analyst at Stamford, Conn.-based Gartner Inc. Microsoft's product, for instance, isn't designed to support multiple lines of business, he said.

But, Outlaw added, "I have no doubt that they will gradually add more and more functionality to the product to make it appeal to larger and larger companies."

Roots in Logistics

Great Plains entered the CRM space in 1997 with a logistics-intensive field service product to manage the dispatch of technicians to repair jobs. Two years later, the company forged a relationship with San Mateo, Calif.-based Siebel Systems to get its name on Siebel's midmarket CRM product, calling it Great Plains Siebel Front Office, Holt said.

Holt said Microsoft's CRM technology won't have the sales channel management or telemarketing campaign management capabilities that Siebel MidMarket Edition has. Microsoft's product will handle only e-mail campaign management, she said.

According to Erin Kinikin, an analyst at Cambridge, Mass.-based Giga Information Group Inc., "It's not clear that midmarket companies want — or can afford — all the functionality that Siebel MidMarket gives them." She added that "the dirty secret of CRM is that most companies only use about 20% of the functionality."

"The CRM midmarket has been crying for a market leader," Kinikin said. "Siebel and the big ERP vendors are too complex. And none of the midmarket vendors are a good long-term viability bet. None are profitable."

Key Microsoft Business Applications

Great Plains eEnterprise
APPLICATIONS: Accounting and finance, field services, e-commerce, supply chain management, project accounting and human resources
TARGET AUDIENCE: Companies with 500 to 5,000 employees and less than $800 million in revenue
LICENSING PRICE RANGE: $75,000 to $250,000

Great Plains Dynamics
APPLICATIONS: Accounting and finance, e-commerce, supply chain management, project accounting and human resources
TARGET AUDIENCE: Companies with 25 to 500 employees and $5 million to $50 million in revenue
LICENSING PRICE RANGE: $5,000 to $50,00 per user

Great Plains Solomon
APPLICATIONS: Accounting and finance, field services, e-commerce, supply chain management, manufacturing, project accounting and human resources
TARGET AUDIENCE: Companies with 25 to 500 employees and $5 million to $50 million in revenue
LICENSING PRICE RANGE: $5,000 to $75,000

Microsoft Delays Launch of .Net Server Operating System

Also announces plans for XP service pack

BY CAROL SLIWA

Microsoft Corp. disclosed last week that the release of its new Windows .Net Server operating system is being delayed ootil the second half of the year — the same time frame in which the first service pack of updates and fixes is due to emerge for its Windows XP desktop operating system.

The company launched XP Oct. 25, but corporate users often wait for a product's first service pack before they consider deployment. A service pack typically includes all of the security patches and critical updates released since the product's launch.

If corporate users wait for the first service pack of the delayed Windows .Net Server, deployments could be pushed into 2003, at the earliest.

But Tom Bittman, an analyst at Stamford, Conn.-based Gartner Inc., said users don't have to wait for the service pack with Windows .Net Server because of the incremental nature of most of the changes. "I think the way to see this is, Windows 2000 was NT 5 and .Net Server is NT 5.1," he said.

The most recent release target for Windows .Net Server had been the first half of the year. A Microsoft spokeswoman said the company's new Trustworthy Computing initiative — which, in part, calls for all software to be scrutinized more intensely from a security standpoint — may cause modifications and additions to engineering processes. She said that could lead to longer delivery schedules but higher quality in the long term. The spokeswoman added that testing and customer feedback also were factors in the delay.

Bittman said Microsoft is trying to solidify the design of the .Net architecture and kill any bugs. "It's not as easy as they were hoping, and I think they're trying to do it right," he said.

Separation Anxiety

The new projected ship date for Windows .Net Server will lead to a separation of at least nine months from the release of the Windows XP desktop operating system. Both operating systems are based on the same source code.

"Clearly, they're going to still try to maintain a common code base, but the more that you separate, the more you have dual-development issues," Bittman said. "For example, if they find a bug in XP right now, they also have to fix that in the libraries being developed for Windows .Net Server."

In addition to the usual bug fixes and security patches, the first service pack for Windows XP will incorporate any operating system changes called for under the consent decree that Microsoft reached with the U.S. Department of Justice, a Microsoft spokeswoman said. She declined to provide further details.

"This is business as usual — the typical rollout for service packs following a product launch," she said.

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BRIEFS

Novell Names Vice Chairman; COO Leaves

Novell Inc. brought back former executive Christopher Stone to work as vice chairman within a new "office of the CEO." Stone will report to CEO Jack Messman and will run engineering, marketing, consulting and other units. Novell also announced the resignation of Stewart Nelson, who had been chief operating officer. In addition, the company reported revenue of $271 million for its first quarter ended Jan. 31.

New York Times Co. Fixes Intranet Holes

The New York Times Co. patched security holes in its corporate intranet after a hacker accessed some of the company's databases, including one that contained Social Security numbers and other information about new employees. A spokesman said it's continuing to investigate to ensure that the network is protected against further intrusions.

Security Flaws Found In PHP Language

Security researchers warned of multiple vulnerabilities in the open-source PHP scripting language. The holes could put Web servers running early versions of PHP for Apache on Linux and Solaris at risk of being hit by buffer overflow attacks. The problem can be fixed by installing a patch available at *www.php.net* or by upgrading to Version 4.1.2 of the HTML-embedded scripting tool.

ICANN's Lynn Calls for Organization Overhaul

Stuart Lynn, president of the Internet Corporation for Assigned Names and Numbers (ICANN), proposed a series of structural changes at the Marina del Rey, Calif.-based organization, including a reduction in the size of its governing board and the end of at-large board elections.

BEA Moves to Better Unify Its Middleware

Users say they like the idea of integrating products but don't want to be locked in

BY MICHAEL MEEHAN
SAN DIEGO

LOOKING TO improve the ability of its middleware to serve as enterprise-grade glue for users with a mix of different applications, BEA Systems Inc. last week announced plans to combine its tools into a unified and better integrated bundle.

At its annual user conference here, San Jose-based BEA said it's linking its application server, portal and integration software into a single package along with a new Java development tool that was unveiled last week (see related story below). The company is building shared source code into the products so they will be easier to install and work more in concert, BEA executives said.

IT managers at BEA's eWorld 2002 conference said they want exactly that kind of unified application infrastructure. But they also acknowledged that if BEA and its chief middleware rival, IBM, succeed in delivering the technology, users who buy into it will become highly dependent on the vendor they choose.

"So far, [BEA's software] user fees haveo't been a problem for us, but it's always a concern," said Denise Fishel, director of e-business planning and development at Toshiba America Business Solutions Inc. in Irvine, Calif.

BEA's WebLogic Server software is playing a key role in a $2 million project to unify the different online portals that Toshiba America developed for dealers of its copiers, fax machines and printers. The company is also switching from a homegrown e-commerce system to Oracle Corp.'s iStore software. "Without BEA in the middle, we wouldn't be able to undertake this kind of migration," Fisbel said.

More on Its Plate

At the user conference last week, BEA also:

- Announced a WebLogic Server release that adds support for IBM's S/390 and zSeries mainframes.
- Said it had acquired Appeal Virtual Machines AB, a Stockholm-based developer of Java virtual machine (JVM) software.
- Detailed an agreement with Intel to optimize Appeal's JVM code for use servers based on Intel's Xeon and Itanium chips.
- Launched a new Internet portal and other tools to support developers who use its WebLogic Server and its other products.

The integrated WebLogic Platform 7.0 bundle is due to ship by midyear, but BEA didn't disclose pricing details last week. The package is based on WebLogic Server 7.0, a new release of the company's flagship application server.

United Air Lines Inc.'s loyalty services division, which manages frequent-flier programs for the Chicago-based airline, is another WebLogic user. Rob Robless, chief technical officer for the division, said he hopes to use Enterprise JavaBeans within the BEA software to componentize applications so they can be ported to multiple operating systems.

"The whole idea of this is not to be controlled by the technology," Robless said. But he added that users can find themselves stuck with vendors no matter what technology choices they make.

Alfred Chuang, BEA's president and CEO, said competition and the complexity of enterprise-level IT infrastructures should prevent any single vendor from grabbing too much power.

Rick Barry, a BEA user who is vice president of information systems at Dallas-based broadband services provider IP Communications Inc., suggested customers who want to avoid technology lock-in should refrain from using proprietary extensions that vendors build into application servers and other Java-based software.

Robless said users should also pay attention to how quickly vendors such as BEA take their proprietary product add-ons and open them up to other vendors through Sun Microsystems Inc.'a Java Community Process.

Java Tool Tied to WebLogic, for Now

BEA Systems claimed that the WebLogic Workshop development framework it unveiled last week will make big strides in easing the creation of Java-based Web services applications for programmers of all skill levels.

But while corporate developers may want better general-purpose Java tools, it remains to be seen how much the BEA tool will help address their needs. That's because in its current form, WebLogic Workshop is only for building Web services and will run only on BEA's application server platform.

"I would have to see BEA's offering, but I would be very concerned about proprietary annotations that would mean I couldn't move an application between multiple platforms," said Bob Dutile, a senior vice president in Cleveland-based KeyCorp's application architecture group, which uses IBM's rival WebSphere application server package.

"One of the reasons we are a Java shop is because Microsoft was too proprietary," Dutile added.

Mark Driver, an analyst at Stamford, Conn.-based Gartner Inc., said other vendors' tools don't understand the "proprietary" annotations that BEA built into the Workshop source code. The annotations provide instructions on how to wrap a Java program as a Web service and deploy it on the application server.

BEA senior product manager Byron Sebastian acknowledged that "some amount of work" would have to be done to get the Workshop tool, code-named Cajun, to run on another application server. "But it's certainly possible," he said.

Sebastian added that BEA plans to standardize the annotations used in the new development framework through Sun Microsystems' Java Community Process.

But some analysts said there's no guarantee that other vendors will use the resulting reference implementation to create tools that can run on non-BEA platforms.

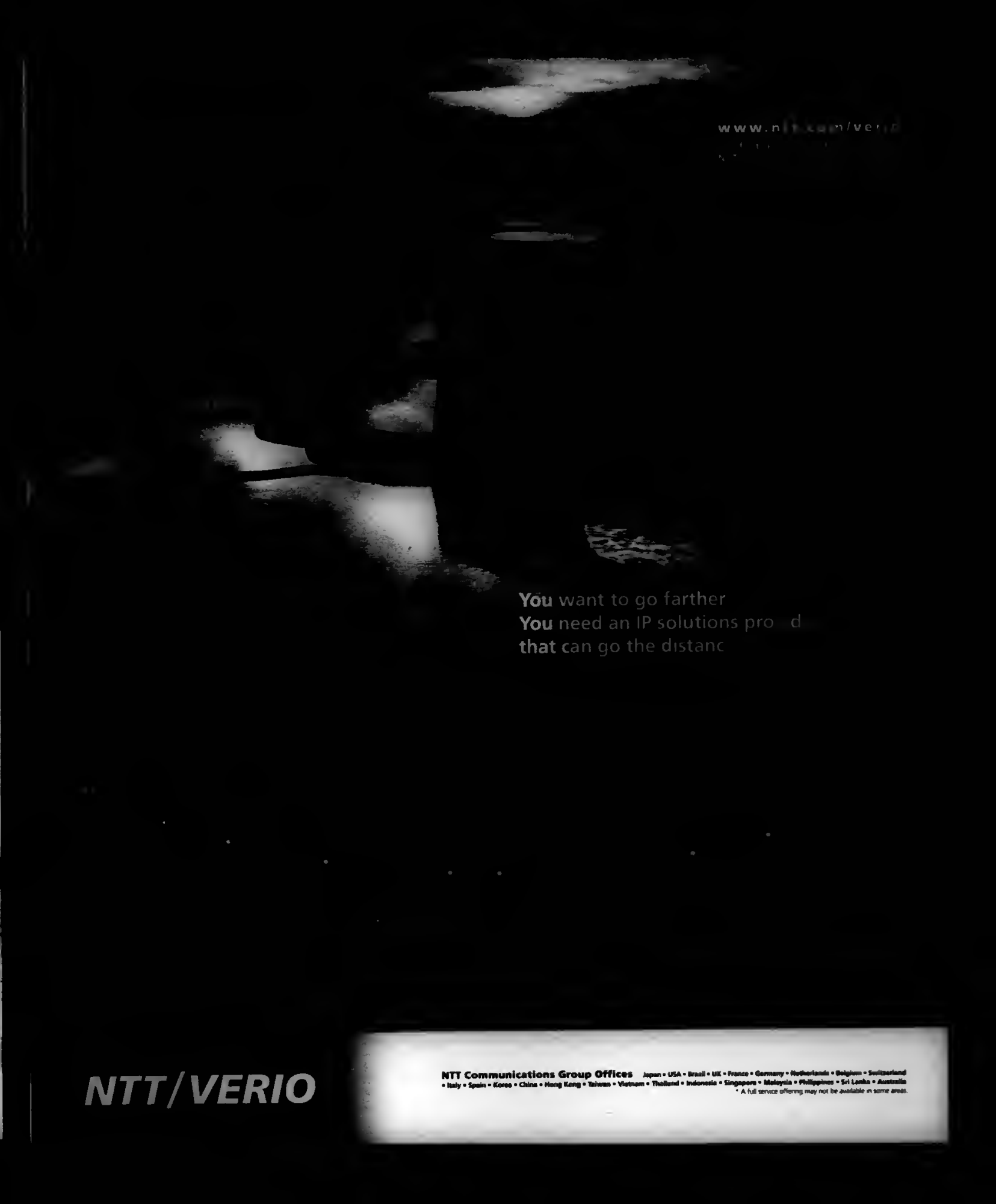
Nick Gall, an analyst at Meta Group Inc. in Stamford, Conn., said he thinks different vendors will eventually offer Java development tools based on a consensus-driven standard. But, he predicted, that "will take another 18 months to solidify."

Engineered by former Microsoft Corp. employees, BEA's new framework aims to remove the need for developers to understand the complexities of the underlying Java environment, similar to the way Microsoft's Visual Basic eases programming for Windows.

A beta version of WebLogic Workshop is available now, and the tool is due to ship later this year. Sebastian said the tool is for building Web services applications only, although analysts predicted that it will become more general-purpose.

"This is only the first step of many that will need to be taken by BEA and other vendors if the 'J2EE development is too hard and painful' trend is going to be adequately addressed," said John Meyer, an analyst at Cambridge, Mass.-based Giga Information Group Inc.

~Carol Silwa



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DHL Builds U.S. Data Center To Help Manage Global Net

Arizona facility will cost $250M over five years, link to sites in U.K. and Malaysia

BY LINDA ROSENCRANCE

DHL WORLDWIDE Express Inc. plans to spend $250 million over the next five years to build and operate a U.S.-based data center that will complete a trio of facilities designed to provide round-the-clock management of the air freight carrier's IT systems and networks.

The new data center will be located in Scottsdale, Ariz., and is due to be fully operational by September, San Francisco-based DHL said last month. The Scottsdale facility will be linked to the company's existing data and IT services centers in London and Kuala Lumpur, Malaysia.

Each center is located within one of the three geographic regions DHL uses to divide its global business operations into separate units. But the IT facilities will work in tandem to manage the company's entire network infrastructure 24 hours a day, seven days a week, DHL said.

Eacb data center will be in charge of the company's DHLNet computing and telecommunications network for eight hours and will then pass control to the next facility. DHL said the centers will manage IT operations in nine-hour shifts, covering the eight hours of network support plus a one-hour overlap period for the transfer of control.

The Scottsdale facility will occupy 106,000 square feet of space, according to DHL. A company spokeswoman would not comment on the systems and applications that will be installed in Scottsdale, other than to note that the technology used at DHL's regional data centers includes network monitoring tools and fault-reporting systems.

Those systems are designed to ensure that IT problems are detected quickly, the spokeswoman said. In the event of network failures, backup systems and network circuits will kick in automatically, she added.

DHL currently has a smaller IT operation in Burlingame, Calif. The company said it plans to employ about 350 workers at the Scottsdale facility, mixing new hires with workers who will be transferred from Burlingame and other sites in Canada and Latin America.

Continued from page 1

Mainframe Skills

using part of his annual training budget to bring younger workers up to speed on mainframe technologies.

And the skills crunch is only going to get worse, according to Stamford, Conn.-based Meta Group Inc. As part of preliminary results from a survey of 300 midsize and large companies, Meta last month said it found that 55% of IT workers with mainframe experience are over 50 years old.

A bigger problem is that more than 90% of the companies that have mainframe staffs said in the survey that they have "zero strategy" for dealing with the diminishing pool of skilled workers, said Meta analyst Maria Schafer. Meanwhile, all indications are that legacy mainframe systems and applications — not to mentioo new technologies such as IBM's zSeries servers — will be around long after those workers have retired.

Companies continue to add a total of about 5 billion lines of Cobol code annually to their data center systems, according to Bill Ulrich, president of management consulting firm Tactical Strategy Group Inc. in Soquel, Calif. And IBM in January said its annual mainframe revenue grew last year for the first time since 1989.

Industries that are expected to be hit particularly hard by the mainframe skills shortage include telecommonications, banking and finance, insurance and government, all of which have huge installed bases of mainframe systems.

"The mainframe is the foundation that everything is built on [here]," said Don Greb, first vice president and manager of information processing engineering services at Mellon Financial Corp. in Pittsburgh. "The majority of our data is still residing on a mainframe, even though a lot of it is fronted through the Web and e-commerce applications."

Among other steps it is taking aimed at preserving its mainframe know-how, Mellon has launched a summer internship program during which the company teaches mainframe skills to university studeots it hopes to recruit after they graduate, Greb said.

But David Lewis, CIO for the Massachusetts state government, said he's more concerned about the skills that can't he taught and have to be learned by workers through hands-on experience.

"Where you start running into really tricky issues is around the products that run on the mainframe and how they interrelate to each other," Lewis said, calling that "an acquired skill" that will take time for new workers to grasp.

"You don't go to school to see how CA interacts with IBM," Lewis said, referring to software vendor Computer Associates International Inc. in Islandia, N.Y. "You learn it by experience. That's where I frankly think the greatest risks exist [for companies]."

Mainframes Ride Again

- IDC's mainframe revenue rose last year for the first time since 1989. In addition, shipments of mainframe MIPS increased 12% year-to-year in the fourth quarter and by more than 40% in each of the other three quarters.
- More than 200 billion lines of Cobol code are still in use today, and 5 billion lines are added to production systems each year. It costs $365 per line to replace Cobol-based programs.

SOURCES: IDC, GARTNER INC. AND TACTICAL STRATEGY GROUP INC., SOQUEL, CALIF.

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Attention: Calling All Cobol Veterans

Bill Payson is sick and tired of debating whether Cobol is obsolete. "The fact is, there's so much Cobol out there that companies are going to have to deal with it," said Payson, president of The Senior Staff, a Campbell, Calif.-based online job information data bank for IT workers who are 35 or older.

Payson is helping to organize the Legacy Reserves, which he described as "a free-agent initiative" for retired, semiretired or out-of-work Cobol programmers who are seeking freelance assignments. The plan will be formally launched in June at the Cobol Expo 2002 conference in Chicago.

The Legacy Reserves is being set up by a partnership that also includes the Pleasant Hill, Calif.-based Professional Association of Contract Employees (PACE) and Micro Focus International Ltd., a Rockville, Md.-based vendor whose products include a Cobol software compiler.

Payson, who is working from a database that contains the names of mainframe programmers, many of whom previously were tapped to work on Y2k projects, said he has identified 3,000 to 4,000 Cobol veterans who want to return to work on a contract basis.

"They don't want full-time jobs, but they're sick of sitting on the bench or playing golf all the time," he said.

Although all the details have yet to be worked out, the idea is that companies would go through PACE to contract with workers who are listed in Payson's database. PACE would function as the employer of record for the workers.

The Legacy Reserves also plans to offer workers training in Java and other technologies that can be used to Web-enable mainframe applications, Payson said.

Bob Schwartz, CIO at Matsushita Electric Corporation of America's Panasonic Co. division in Secaucus, N.J., said Payson's database of experienced workers "may become intriguing to use when we need those skills."

But other IT managers said they would prefer to hire full-time employees, not contractors.

"With contractors, there tends to be less of an organizational affiliation," said Louis Gutierrez, former CIO at Harvard Pilgrim Health Care Inc. in Wellesley, Mass.

"With full-time [employees], you can really work on staff development and incorporating them into an organizational mission," added Gutierrez, who's now a principal at Exeter Group Inc., an IT consultancy in Cambridge, Mass.

– Julia King

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American Express Signs $4B IT Services Deal With IBM

Pay-as-you-go contract includes transfer of 2,000 IT workers to IBM

BY TODD R. WEISS

In a blockbuster deal that's expected to be worth more than $4 billion over the next seven years, American Express Co. is outsourcing a big piece of its IT operations — and transferring about one-third of its 6,000 technology workers — to IBM.

New York-based Amex last week said it expects to save "hundreds of millions of dollars in IT costs" during the life of the outsourcing contract with IBM's Global Services unit.

The deal took effect on Friday in the U.S. and will be extended to the financial services firm's international operations starting in May.

Under the agreement, Amex will maintain oversight of its IT strategy, key vendor relationships, its voice and data network and development of applications and databases. But the company will give IBM the reins of its IT operatinns infrastructure, including major data centers in Phoenix and Minneapolis.

Amex CIO Glen Salow said the company, which processes about 1 hillion transactions daily, will receive IT support services from IBM on an as-needed "utility model" hasis.

As part of the deal, IBM has promised to proactively reallocate IT resources and add new computing capahilities as husiness needs change at Amex.

In addition, part of the fees Amex pays to IBM will depend on the amount of IT services work it actually requires. Salow described that part of the arrangement as "out-tasking." The deal "achieves a level of flexihility while assuring ourselves . . . a good price and quality [of service]," be said.

Bruce Caldwell, an analyst at San Jose-based Dataquest Inc., said the agreement mixes traditional outsourcing with the new pay-as-you-go approach to IT services being offered by IBM and rivals such as Electronic Data Systems Corp.

High-Profile Customers

IBM's success in signing up a high-profile customer such as Amex gives the utility concept — as well as IBM — a hig credibility boost, Caldwell said. "It's a major endorsement hy a major American company with huge IT resources," be said.

The IT contract between Amex and IBM follows a $175 million agreement for as-needed IT services that Plano, Texas-based EDS signed last month with Dallas-based convenience store chain 7-Eleven Inc. EDS also signed a similar services contract in August with Golden, Colo.-based Coors Brewing Co.

The 2,000 Amex employees who will be offered positinns at IBM include IT operations workers, technical support staffers and programmers, the companies said. About 1,000 of them work at the Phoenix data center.

The transfer of the U.S. IT operations is due to be completed this month, while international operations will be shifted in a phased approach that's expected to take several months.

IBM will manage data center services from the Amex IT facilities in Phoenix and Minneapolis. Technical support services will also be provided on-site to Amex's business operations worldwide, the companies said.

When choosing a technology partner, there are many things to look for.

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Ariba Ships 'Spend Management' Tools

Shift from B2B aims applications at managing, analyzing corporate spending

BY MICHAEL MEEHAN

Ariba Inc. last week announced new invoicing, spending analysis and contract monitoring tools, continuing its attempt to redefine itself as a vendor of "spend management" software instead of business-to-business products.

Sunnyvale, Calif.-based Ariba formally introduced its Spend Management Suite, which adds purchasing analysis capabilities to its product sourcing and procurement tools. Ariba is also expanding its sourcing and procurement lines with several new or upgraded applications.

All of the products became available last week except for the analysis software, which is in beta-testing now and is set for general release by the end of this month, Ariba said.

The new suite continues a migration away from transaction-centric business-to-business software that Ariba began early last year and accelerated in the fall after Robert Calderoni was named CEO.

Analysts said the strategy change was critical for Ariba's continued survival after the business-to-business market crash last year. But they cautioned that the company's transformation is far from complete.

Ariba's technology roots are in "white collar procurement" applications that automate the purchasing of office supplies and other goods outside manufacturing, said Karen Peterson, an analyst at Gartner Inc. in Stamford, Conn. "They still need to prove that they can expand into more complex areas of the enterprise," she said.

Ariba faces plenty of competition for managing supply chain purchasing activities, Peterson said. She described i2 Technologies Inc. in Dallas as the vendor with the most in-depth technology for managing supplier relationships.

Frictionless Commerce Inc. in Cambridge, Mass., also sells an integrated purchasing suite, and it teamed up with Rockville, Md.-based supply chain vendor Manugistics Group Inc. last summer to offer a unified set of supplier relationship management tools.

Commerce One Inc. in Pleasanton, Calif., plans to add new invoicing and contract management applications by midyear, and Peterson said enterprise resource planning (ERP) giants such as SAP AG and Oracle Corp. are also developing full suites of sourcing, procurement and spending analysis tools.

Joseph Marino, an analyst at Current Analysis Inc. in Sterling, Va., said the first release of Ariba's spending analysis tool "is not fully developed at this point" and will likely require a lot of fine-tuning.

But Marino said Ariba and other business-to-business vendors can still beat ERP and supply chain vendors on procurement functionality. ▶

Buying Tools

Ariba's Spend Management Suite consists of the following products:

ANALYSIS TOOLS to help users examine corporate spending patterns and identify possible savings.

SOURCING SOFTWARE that automates the process of finding new suppliers and putting contracts out for bid.

PROCUREMENT APPLICATIONS that manage purchasing transactions through the entire invoicing and payment cycle.

Intel Sticks With R&D and Production Spending Plans

CEO says new technology needed to boost chip sales

BY JENNIFER DiSABATINO
SAN FRANCISCO

Intel Corp. suffered along with other technology vendors during 2001, which CEO Craig Barrett described in January as "a terrible year." But the chip maker isn't backing off from its plans to invest heavily in product development and new manufacturing facilities.

Despite a big drop in chip sales, Intel is moving forward with development and capital spending programs expected to cost about $20.7 billion in combined expenses from this year and last year. Barrett said at last week's Intel Developer Forum here that the firm is dipping into its cash reserves to help fund the spending.

But Barrett said the investments are needed to help nurture Intel's "ecosystem" — the vendors that depend on improved processing power to develop new products and the users who need those products to meet business demands.

"We have to innovate our way out of this recession with new technology, new products," he said. "If there was ever a time where we needed to move faster down the technology curve, this is it."

Intel made a slew of product announcements at the semiannual conference, touting faster processing speeds as a key feature. Topping the list was a new Pentium 4-based Xeon processor for use in two-way servers (see box). The company also announced that a second-generation version of its 64-bit Itanium processor, code-named McKinley, will be released this summer.

New Manufacturing Process

In addition, Barrett said Intel has started shipping microprocessors built at a new plant in Oregon that uses 300mm wafers and its 0.13-micron manufacturing process. Five plants worldwide use the 0.13-micron technology, he said.

NEW PRODUCTS

Chips In The Bag

Intel announced these products last week:

A Pentium 4-based Xeon processor that boosts the speed of dual-CPU servers by up to 80%

A companion E7500 chip set that doubles the memory bandwidth of Xeon-based servers

Three single-chip Gigabit Ethernet controllers for use in PCs and servers

A line of network and storage networking processors based on Intel's XScale technology

To help fuel a return to growth, Barrett said, IT vendors need to address issues related to online security and the use of technologies such as wireless communications and Web services.

Intel itself could aid in improving IT security by providing increased processing power to accommodate demanding encryption protocols, said Graham Titterington, an analyst at Ovum Ltd. in London.

But Titterington and other analysts said any new developments, such as stand-alone encryption chips, probably won't be available in products for at least a couple of years. ▶

BRIEFS

Judge Denies Xerox Injunction Request

A federal judge in Rochester, N.Y., denied Xerox Corp.'s request for an injunction that would have barred Palm Inc. from selling its handheld devices. Santa Clara, Calif.-based Palm is appealing the judge's December ruling that it and former parent company 3Com Corp. infringed on a handwriting-recognition patent held by Stamford, Conn.-based Xerox.

Sapient Makes 22% Workforce Cut . . .

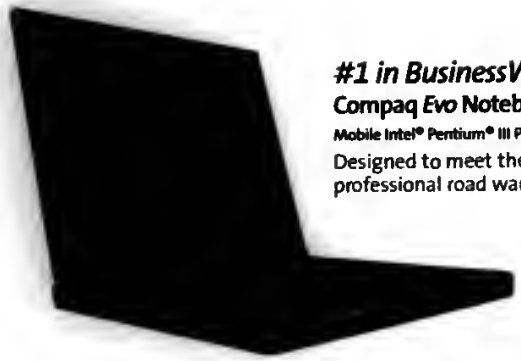
Sapient Corp. laid off about 545 employees in the third round of cutbacks at the e-business consulting firm during the past 12 months. The new layoffs reduced Cambridge, Mass.-based Sapient's workforce by 22%. The company also warned that its first-quarter loss could be slightly larger than expected and said its chief financial officer is leaving to take another job.

. . . While Scient Has Big Revenue Drop

New York-based IT consulting firm Scient Inc. reported pro forma revenue of $20 million for the fourth quarter, down 85% from $132 million in the same period of 2000. Scient said it lost $55 million in the quarter, compared with a year-earlier loss of $274 million. The results are combined for the former Scient Corp. and IXL Enterprises Inc., which merged in November.

Short Takes

Tulsa, Okla.-based broadband network operator WILLIAMS COMMUNICATIONS GROUP INC. said it may file for bankruptcy protection as part of a debt reduction plan. . . . COMPAQ COMPUTER CORP. has agreed to sell a server printed circuit board manufacturing plant in Ayr, Scotland, to St. Petersburg, Fla.-based JABIL CIRCUIT INC.



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Designed to meet the needs of professional road warriors

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The first density-optimized server to provide enterprise-class availability and performance all in a 2U form factor

Best Desktop PC, Best of COMDEX 2001

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1st Class Award, Mobile Computing, Feb. 2002

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PATRICIA KEEFE

The Question for 2002

"WHAT HAVE YOU done for me lately?" may well be *the* question for 2002. Be it companies asking workers or workers asking companies, that cry hangs endlessly in the air as revenue-stressed businesses forget to care and workers struggle to remain motivated. For most of us, this means more pressure to increase our workloads.

Patricia Keefe is editorial director at *Computerworld*. You can contact her at patricia_keefe@computerworld.com.

IT management is under intense pressure to think up new ways to cut costs, increase revenue or improve productivity. There's no time for resting on past laurels when even greater heroics are demanded. In our Business section this week (page 28), we look at three IT leaders who met that challenge. Each delivered solutions that not only addressed current problems but will also provide payoffs down the road.

One is Fran Dramis at BellSouth, who designed a technology transformation road map to help business units define the systems they need to enhance and grow revenue — not just for today, but for years to come.

To view IT heroics on a national scale, check out our Page One update on what happened to the flood of offers of technical assistance in the wake of the Sept. 11 attacks. Our stories look at just a few of the many inspiring actions taken by IT professionals willing to look beyond their personal pain to find ways to contribute. For many, *the* question became, "What can I do for my community now?" not, "What has my community done for me lately?"

Indeed, hundreds of thousands of IT volunteers signed up, and many were tapped. Because of them, an unbelievable amount of progress was made. But, as our report uncovers, we also need an organizational road map to make sure we're better prepared to harness our nation's collective IT resources the next time disaster strikes.

The problem? A cacophony of well-meaning efforts all targeting the same goal — matching up IT professionals and equipment with companies needing assistance — but with different approaches and levels of expertise. Many offers of assistance went unheeded as a result, and yet the need is more important than ever. (See our list of links for places to donate, page 6.)

Here are some suggestions of what you can do in the meantime:

- Back the efforts of Sen. Ron Wyden (D-Ore.), chairman of the Senate Subcommittee on Science, Technology and Space, to create a "national emergency technology guard." It would provide a single point of contact and clear chain of command to coordinate the science and technology sectors to prevent and respond to disasters. Services delivered by this agency would include a database of IT professionals willing to help out, complete with equipment and donations they can offer; a reserve of equipment needed in an emergency; clear guidelines for businesses affected; an emergency hot line and Web site; and a large-scale risk management strategy to protect critical infrastructure.
- Contact the New York Software Industry Association, which will devote its annual summit, being held March 8, to help further centralize business relief efforts.
- Register with groups such as Restart Central, an aid program created by several New York City groups that has so far matched more than 850 donations and volunteers and is still working with about 260 businesses, most of which are looking for permanent office space and basic office equipment.

It's time we all looked into the mirror once again and asked, "What have I done lately for my company, my co-workers, my country?"

PIMM FOX

Portals Can Open Array Of Services

MEASURING THE VALUE of enterprise portals is more art than science.

But don't let that sway you from embracing them to consolidate disparate back-end application services through self-service front ends to save money and boost revenue. Tread carefully, though, because there are obstacles.

Pimm Fox is *Computerworld*'s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.

"The problem with portals is not technology, but rather organizational obstacles defining goals, adopting a clear business plan and even how you describe different portal features," says Nate L. Root, an analyst at Forrester Research.

Vendors contribute to this mess. Their out-of-the-box adapters to back-end legacy applications and outside Web services seem an easy win. But single-source adapters will never be enough to get your portal humming.

To start the portal process and get buy-in from the chief financial officer, look at your ERP implementations for opportunities to streamline access to services. For example, a portal could replace an in-house travel reservation system, dropping money to the bottom line. Define specific functions inside packaged applications from vendors such as SAP, PeopleSoft and Siebel Systems that could help users do their jobs. Delivery of employee-benefit updates or adjustments to production schedules are self-service activities ideal for portal delivery.

This means understanding features that transform a portal into more than just a source for sports scores and company holiday information. Recognize that adding portal users could put a strain on ERP applications, and think

Quick Link: For more *Computerworld* columnists and links to archives of previous columns, head to: www.computerworld.com/q?q=1000

about near-real-time caches to prevent outages.

Portal design should incorporate functions to save money, rather than show off technology. Just because a call center action touches three different back-end systems isn't justification for making it a portal feature. "It might cost more to get rid of those manual touch points while adding unwarranted complexity to the portal," says Root.

And don't confuse portals with application integration from companies such as SeeBeyond Technology, TIBCO Software and Vitria Technology. Portals are about service, not applicatinn integration.

Purchase application servers first, rather than portal or integration servers, because application servers drive portal transactions. And with portals costing more than $1 million tn develop, according to Forrester, you should base portal and integration server decisions around the use of common code.

Plumtree Software, the market leader in portal products, offers a discrete portal server, but you can also take advantage of your application server infrastructure to develop portal technology. For instance, IBM and BEA Systems let you use application server tools to develop portal technology.

Portals hold a lot of promise, but they require special attention before they'll pay dividends.

DAVID FOOTE

Good Ethics At Work Lie In the Hiring

THE ENRON mess sure seems to be opening up a lot of old wounds.

For instance, several years ago, I was employed by a popular consumer electronics company, until it lost half its stock value overnight when it was accused nf playing fast and loose with its financials. Thankfully, being fresh out of school, I had only my mind to lose instead of a fat retirement account.

One must be careful talking about crooked executives, though. Chicanery at the highest levels of corporate America has been tolerated — even romanticized in books and films — since the Rockefellers, Mellons and Kennedys made their fortunes. It's part of our culture. And it's not like we haven't heard populist politicians before preaching reform when hard-working employees are suddenly feeling abused.

Public concern about ethics is cyclical, like hemlines and teenagers' musical tastes. In vogue now are corporate accounting practices, privacy concerns and executive greed. When several on-the-brink dot-coms wanted to sell their online customer lists, consumer advocates protested. When employers began to monitor workers' e-mails and Web surfing behaviors, employees and privacy advocates stewed. And there are always suspicions about relationships between vendors and IT executives, and between recruiters and IT workers.

David Foote is president and chief research officer at Foote Partners LLC, a management consultancy and IT workforce research firm in New Canaan, Conn. Contact him at dfoote@footepartners.com.

We in IT have a choice: subscribe to some code of ethics, or don't. But no policy, program, employer or government can force us to make this choice. On the other hand, no one forced people to work for Enron or to play Russian roulette with their retirement accounts.

Don't expect clarity on what passes for ethics. Deciding where to draw the line on business behavior reminds me of the inability of Supreme Court Justice Potter Stewart in 1964 to adequately explain what constituted pornography and obscenity. Instead, he declared, "I know it when I see it." The same holds true for us. Ultimately, we'll know the companies that best match our personal codes of ethics and should select them as our ideal employers.

This hasn't stopped companies from attempting to police ethical matters, including by using these strategies:

Making employees sign a code of ethics. Lists of ethical standards and practices are simply corporate liability boilerplates that undermine trust and are largely ignored by workers.

Hiring an ethics consultant. College professors moonlight as consultants to arbitrate employer-employee showdowns on ethical matters and to help employers refine policies and practices nn corporate values and ethics. Though helpful, they typically arrive too late to change anything truly consequential and have trouble navigating ethics in the real world of businesses operating under extreme pressure to grind out profits.

Appointing a chief ethics officer. Along with an independent ethics review group advising the board nf directors, "the other CEO" is tasked with keeping alive the notion that ethical concerns dn matter. This sounds good, but reality dictates that this is viable only for companies in which the chief executive's power and influence have been sufficiently checked and balanced.

The only true way to enforce ethical behavior norms is to select and hire the right people. With a focus on personal and professional ethics upfront, enforcement is much easier, and outcomes are more predictable. But this must start at the CXO level so that appropriate behaviors can be modeled by the workforce in the same fashion we model our parents' ethical imprinting.

READERS' LETTERS

Make Spammers Pay

IN "SPAM Taking a Toll on Business Systems" [News, Feb. 18], Todd Meagher of Credit.com said the potential loss of legitimate business correspondence inherent in blocking spam is an acceptable price to pay. It's outrageous that people feel that helpless. Spam costs businesses lots of money. That cost should be borne by the spammers, and tough legislation needs to be enacted to let companies sue those who deluge their in-boxes with spam. In addition, those who send sexually explicit spam to addresses accessible by children need to be prosecuted.

There are a few things people can do to fight spam. First, use an ISP that provides spam filtering. Second, report spam to SpamCop.net, which will parse the headers and determine the real source. You can then notify all the systems administrators involved that their systems have been used by a spammer. But the most effective thing is tn hit spammers where it really hurts: in the pocket. To do that, don't buy anything from a spammer, and ask your congressman tn enact legislation to make spammers pay.

Chuck Hamilton
Oracle DBA
QVC Inc.
West Chester, Pa.

A Matter of Forms

JOE AUER'S article "A Form for Fairness" [Business, Feb. 11] really hit the nail on the head. We've been using form contracts for several years with varying degrees of success. I don't recall seeing a better argument in support of the development and use of form contracts.

Thanks for the insight.

Jim Garrison
Assistant director/contract management
Purchasng Department
North Carolina State University
Raleigh

On the Wrong Trail

FRANK HAYES' "The Story So Far" [CRM Knowledge Center, Feb. 18] wasn't a history of customer relationship management but of prospect relationship management. The trail he should have followed was that nf the field service products of the early 1980s (FieldWatch, Metrix, Decision Sciences) and customer support products nf the late '80s (Clarify, Vantive, CustomerSoft, Clientele and many others).

Jacky Hood
President
Crescent Project Management
Mountain View, Calif.

Finding a Future in IT

MELISSA SOLOMON'S "Layoff Lessons Learned" [Business, Feb. 11] was a pertinent, well-written article. The "10 Tips for Job Seekers" sidebar mentions the New York-based organization Futures in Information Technology, and I am interested in learning more. Could you assist with a Web link?

Arnold M. Abate Jr.
LAN administrator
Verizon/MSX International
Niskayuna, N.Y.

Editor's note: *Futures in Information Technology (www.futuresinit.org) offers free career counseling, job placement services and technical training to unemployed IT professionals in the New York tri-state area.*

COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

Quick Link: For more letters on these and other topics, visit our Web site: www.computerworld.com/cwopinion

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THIS WEEK

DELIVERING THE GOODS

CEOs and chief financial officers expect their IT leaders to come up with ideas to help their organizations slash costs and pump up sales in good times and bad. Read how three movers and shakers are getting the job done. PAGE 28

RIGHTING THE SHIP

CIO Tom Murphy inherited a dysfunctional IT organization when he joined Royal Caribbean Cruises Ltd. in April 1999. Thanks to his dynamic motivational and leadership skills, he's put the IT department back on course. PAGE 30

BOOK REVIEWS

Find out what our reviewers have to say about a new book with advice about managing and motivating Einsteins, a primer on running a "conductorless" organization and a soup-to-nuts guide for project managers. PAGE 34

DIVERSITY

Women in IT typically fall into one of two categories when dealing with perceived gender barriers at work: "Woe is me" or "Says who?" writes Kathleen Melymuka. PAGE 36

PAUL A. STRASSMANN

Out of Alignment

I HAVE ALWAYS BEEN AMUSED by simplistic methods offered to CIOs to answer complex questions about the health of IT. One recent attempt is particularly noteworthy because it received widespread publicity and reputable endorsements.

Last fall, a journal for CIOs published a five-page feature, advertised as a diagnostic tool, with the ambitious title "How to Improve IT/Business Alignment." Introductory explanations claimed that this technique was successfully tested with more than 25 Fortune 500 companies and used in studies sponsored by the Society for Information Management and The Conference Board.

It required the placement of check marks on a grid consisting of five columns and 38 lines representing 38 questions. A check mark in the first column was worth one point, a mark in the second column two points, and so forth, with five points for each mark in the fifth column. A respondent could score anywhere from 38 to 190 points, with a relatively high score signaling a high level of IT alignment with the rest of the business. The proponents' assumption was that the higher the score, the stronger the alignment, and therefore the more benefits a business would see, which would ultimately be reflected in its financial performance. For instance, if a CIO reported to the CFO, that would be worth one point. If the CIO reported to the CEO, that would be five points. "Rarely measuring the value of IT investments" was worth one point, but using a balanced scorecard approach awarded you five points. Other characteristics that were scored included service-level agreements, how projects are prioritized and architectural integration.

The publicity given to this methodology and its claims heightened my curiosity about its value. As a scorekeeper of corporate profitability and IT spending, I offered to test the tool's validity. The researchers graciously provided me with each corporation's individual score (subject to an agreement to not reveal the identities of the firms or researchers).

My findings? After I compared the alignment scores with the actual financial results delivered by the firms that were used to test the methodology, I found absolutely no relationship between the overall score and other independent measures of financial results. There were high-scoring firms that were losing money, and there were low-scoring firms that delivered exceptional profits. So the methodology failed in perhaps its most important test of relevance to a board of directors.

I view that as an example of contemporary astrological practice as applied to assessing IT excellence. Astrology, in which I take an active interest, takes factual observations about stars, planets and the calendar and converts them — by unverifiable methods — into prophecies about events on Earth. I would classify any method for cobbling together descriptions about IT-related practices into predictions about IT excellence as being like astrology rather than an application of reproducible analysis that can help IT.

Executive Implications

I have seen many examples of methodologies that follow similar patterns. Some are relatively modest and perhaps involve filling out a grid. Others are ambitious, often asking that more than 150 line items be scored via elaborate schema. This includes most of the measurements of an organization's "maturity level." The widely applied balanced scorecards disguise their astrological origins by arbitrary choices of ratings criteria. For instance, one requirement to qualify a firm's ranking of its computing innovation attributed 20% of that score to whether it installed the latest version of Windows on all desktops!

All of these methods measure criteria that are mostly unrelated to top executive concerns, which are primarily economic. In other words, CEOs couldn't care less about conformity with what academia claims are desirable behaviors. What they do care about is increasing profitability and whether IT is helping to do that.

As IT management and budgets come under increasing scrutiny today, don't bank on scoring well using astrologylike methods. Proving that dollars saved and earned will add to the bottom line will count for more. ▮

PAUL A. STRASSMANN (paul@strassmann.com) believes that astrology-like methods are popular ways to measure the health of IT because they're cheap, don't require much effort and avoid accountability.

BOB COATES (fourth from the right), CIO at Edwards Theatres Circuit, helped automate cash flow for one of the largest theater chains in the U.S.

CIO
Edwards Theatre
Newport Beach
Automating
processes

Cut from three months to two weeks the amount of time needed to close the books" for each week of a movie's run; accurately divides box-office receipts between studios and theaters quickly to avoid overpayments

A 20-year veteran of command-and-control systems in the Marine Corps, Coates moved into civilian life first as a PeopleSoft manager at Anaheim, Calif.-based CKE Restaurants Inc., which runs the Hardee's and Carl's fast-food chains. The former chief financial officer at CKE lured him into the movie business a year later, in early 1999

Bob Coates

RUNNING A STRING of movie theaters is dicey in the best of times. Not only must you book the most profitable movies; you also have to negotiate and track arcane formulas to split the take with movie studios, attract the crowds, sell the concessions and manage your cash. That's especially tough in a market so overbuilt that many of the biggest players have filed for bankruptcy protection.

The main problem is knowing how much money you're taking in and how much to put aside for the studios: Put aside too little, and you have to make it up later; too much, and you have to borrow to keep the business running.

"You're constantly in a battle to manage your cash," says Alan Davy, executive vice president and head film buyer at Edwards, a $350 million chain.

Until a few years ago, Edwards did that with "pencil and pad and clerks in green eyeshades," says Davy. Aside from a J.D. Edwards & Co. accounting system used to cut checks, the operation had almost no computers.

One of the first jobs facing Coates when he became the company's first CIO was to automate that process — both to save money and to give managers a tighter grip on the business.

Although he had no legacy systems to add to his headaches, Coates had to convince senior management to pay for a cash-flow system, a standardized point-of-sale system and a wide-area network to connect them. He also had to push for standardized business practices so the results would make sense. His task was complicated by the fact Edwards had filed for Chapter 11 bankruptcy protection in early 2000 (it emerged from bankruptcy in September 2001).

The result was a cash-flow automation system nicknamed RITA (for reliable, integrated, timely and accurate) that was built in Visual Basic 6.00 top of a SQL Server 2000 database. Theater managers upload results nightly, and the system calculates revenue and payments due to studios and shunts data into a data mart and a series of reports that give managers online access to current results. Development started in November 1999 and was completed in December of last year at a total cost of about $1 million, Coates says.

"The old way was a monumentally cumbersome system," Davy says. "Now, I can do most of it online and make changes quickly."

— Kevin Fogarty
kevinjfogarty@yahoo.com

GOT A SUCCESS STORY TO SHARE?
Tell it to our business editor at
bizeditor@computerworld.com

What Have You Done For Me Lately?

CEOs and CFOs demand that their IT leaders come up with brilliant ideas for slashing costs, pumping up sales or improving productivity. Here's a look at three hard-chargers who have delivered.

ANN STATE/CHRIS SABO

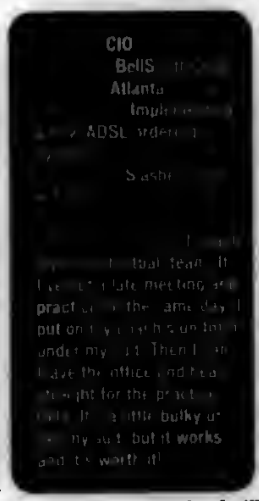
INVESTING IN A NEW CUSTOMER ORDERING SYSTEM "allowed us to increase customers at fairly negligible systems costs," says Fran Dramis, CIO at BellSouth.

Fran Dramis

IN FEBAUARY of last year, BellSouth had a choice: hobble forward on a legacy customer ordering system or invest in a new one that would better support thousands of new broadband subscribers — a linchpin customer segment in the company's revenue strategy.

It may sound like a no-brainer, but given the post-dot-com capital constraints plaguing the entire telecommunications industry, it was anything but an easy decision.

Following Dramis' technology transformatioo road map — which be designed to help business units define the systems they need to build revenue — BellSouth ultimately got the new ordering system.



It took nine months to implement a customized version of Oracle Corp.'s customer relationship management software, which was integrated with proprietary ordering features in other BellSouth systems. This gave new subscribers the ability to order and even self-install the software they would need to get up and running oo the Assymmetric Digital Subscriber Line (ADSL) high-speed service.

The result: By year's end, BellSouth's broadband customer base had grown from 200,000 to 660,000, with 90% of customers using the self-service option. The effort has also resulted in a 50% decrease in per-subscriber ordering costs because the new system supports more customers at a lower cost than the previous one and captures more customer information. That, in turn, works to reduce the number of help desk calls that have to be fielded and helps to identify new services and capabilities that customers want.

One new service is a telecommuting billing option, which lets companies aggregate billing for ADSL services they provide to remote workers.

"All of this allowed us to increase customers at fairly negligible systems costs," says Dramis. "And these are all things that help the growth activities of the business."

For example, he says, just a few years ago, the company's annual ADSL revenue generated no more than "a couple of million dollars." This year, it's a half-billion-dollar business for BellSouth.

"What Fran really does is set the strategic direction," says Lori Groves, the project leader on the ADSL ordering system project. ▶

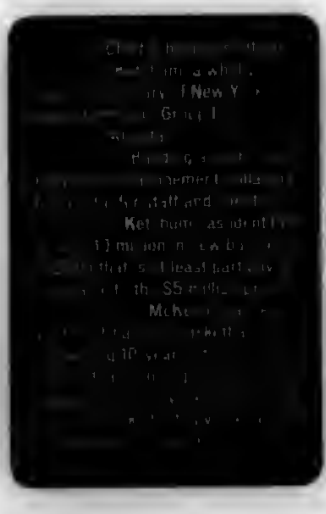
— Julia King

Paul McKeon

SUCCESS IN public relations depends on close working relationships with clients, thorough knowledge of their needs and quick access to information and expertise. Ketchum needed a knowledge management system that would leverage staff expertise, personalize information and increase collaboration.

McKeon's team replaced a first-generation, one-size-fits-all intranet with an intranet/extranet knowledge management portal that customizes information based on user needs. The portal gives all Ketchum professionals and some clients access to informatioo about the firm's staff and resources based on their profiles, and it's customized for foreign-language clients. It also features eRooms, virtual workspaces where clients and staff can collaborate online. The system includes a knowledge base of information from 7,000 documents and a catalog of staff expertise and client engagements. Employees are encouraged to contribute to the knowledge base, and performance reviews are tied to their contributions.

The system uses corporate portal software from Plumtree Software Inc. in San Francisco, collaboration software from eRoom Technology Inc. in Cambridge, Mass., and a customized SQL Server database.



The system "summarizes in 10 minutes what would have taken a couple of weeks of phone calls and research," McKeon says. Less than a year after implementation, staff and clients were sharing more than 400 eRooms.

The project began in January 2000, and the first phase was completed on time and within budget in November 2000. An upgrade was completed in September 2001. Monthly metrics track 30 parameters, including page views, feature use, contributions and eRoom use. According to surveys, staff reaction to the system is 95% positive. ▶

— Kathleen Melymuka

ANN STATE/CORBIS SABA

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— Julia King

CIO
BellSouth Corp.
Atlanta
Implementing a new ADSL ordering system
Slashed costs in half

"I coach my son's football team. If I've got a late meeting and practice on the same day, I put on my coach's uniform under my suit. Then I can leave the office and head straight for the practice field. It's a little bulky under my suit, but it works, and it's worth it!"

Paul McKeon

SUCCESS IN public relations depends on close working relationships with clients, thorough knowledge of their needs and quick access to information and expertise. Ketchum needed a knowledge management system that would leverage staff expertise, personalize information and increase collaboration.

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— Kathleen Melymuka

Chief e-business officer
Ketchum, a wholly owned subsidiary of New York-based Omnicom Group Inc.
Atlanta
Building a customized knowledge management/collaboration portal for staff and clients
Ketchum has identified about $10 million in new business in 2001 that is at least partially attributable to the $5 million project.
McKeon coaches youth softball and basketball. "Coaching 10-year-old girls is much harder than running a business organization, and I've learned lots of tips and tricks that have helped me in my business career."

All Hands On

Royal Caribbean CIO Tom Murphy is pulling together diverse groups.

By Kathleen Melymuka

WHEN CIO TOM MURPHY came to Royal Caribbean Cruises Ltd. in April 1999, the company's IT workforce was as diverse as they come. Employees hailed from more than 40 countries, and nearly half of them were minorities or women.

But IT management was foundering. "I want to be honest with you," President and Chief Operating Officer Jack Williams told Murphy. "IT is screwed up."

"It was a very traditional IT organization: command and control. Everything was locked down; everything was about not spending money," Murphy recalls. "The gentleman who was here before me was a great guy, but very timid, and the CFO basically ran the place.

"It was a traditional '70s data processing shop," Murphy says. Cost-cutting was the mantra. Voice mail was new, and the cruise operator was only dabbling with e-mail. There was no IT strategy for the future and no respect from the business side.

Adam Goldstein, senior vice president of total guest satisfaction, was "vitriolic in his disdain for all things IT," Murphy recalls, and he wasn't alone. "To a person, the business had absolutely lost confidence" in the company's IT department, he says.

"No matter what we did, it was never right," recalls IT Director Percy Lopez.

Internally, the IT group was made up of factions, and morale was terrible. Word around the department was that two opposing "mafias" — Cuban and African-American — controlled the data center and the networking group. "Each department in IT did its thing and didn't want any involvement with the others," says IT manager Dennis Wright.

"It was an emotionless, beaten-down group," says Murphy, who had come from well-oiled, homogeneous IT machines at Marriott International Inc. and Omni Hotels.

AT A GLANCE

Royal Caribbean Cruises Ltd.

LOCATION Miami

EMPLOYEES 27,000

IT EMPLOYEES 400*

NET INCOME $324 million

GROSS REVENUE $3.13 billion

FLEET 23 cruise ships, 47,400 berths

*For four quarters ended Sept. 30, 2001

Note: Royal Caribbean is currently in negotiations for a merger with P&O Princess Cruises PLC, a London-based cruise line with gross revenue of $2.45 billion.

Almost three years later, everything has changed. Silos and resentments have disappeared, and the IT group has become phenomenally successful. Murphy personally sold the board of directors on a $180 million effort called Project Leapfrog aimed at pulling Royal Caribbean into the 21st century.

Since then, the firm's IT group has been overhauling the entire IT infrastructure. This effort includes a PeopleSoft enterprise resource planning implementation, a revamped public Web site and additional automation to facilitate shipboard and shore excursion activities.

These days, the IT department is respected by the business and proud. "I never doubted that he would transform the organization," Williams says. "But [Murphy] did it quicker than I thought he would."

Murphy, 39, insists that there's no magic formula for getting a diverse group to pull together. "All I do is try to create the atmosphere and the environment that allow people to be successful," he says. "It has zero to do with where they came from or what color their skin is. You just remove the barriers and watch people blossom."

When pressed on the point, he acknowledges that there's one more thing that contributes to harmony in a heterogeneous workplace. "Integrity establishes a foundation for everything that you do," he says. "If you don't have that, you have nothing."

The folks at Royal Caribbean watch this play out at work every day. Here's their account of how Murphy manages diversity:

Communication. "He communicates all the time, everything to everybody, and that prevents silos," says Leigh Baker, manager of shipboard applications delivery. "Silos still arise around projects or products, but as long as he's communicating the same message and the same goals to everyone evenly, then no one can use information as a weapon."

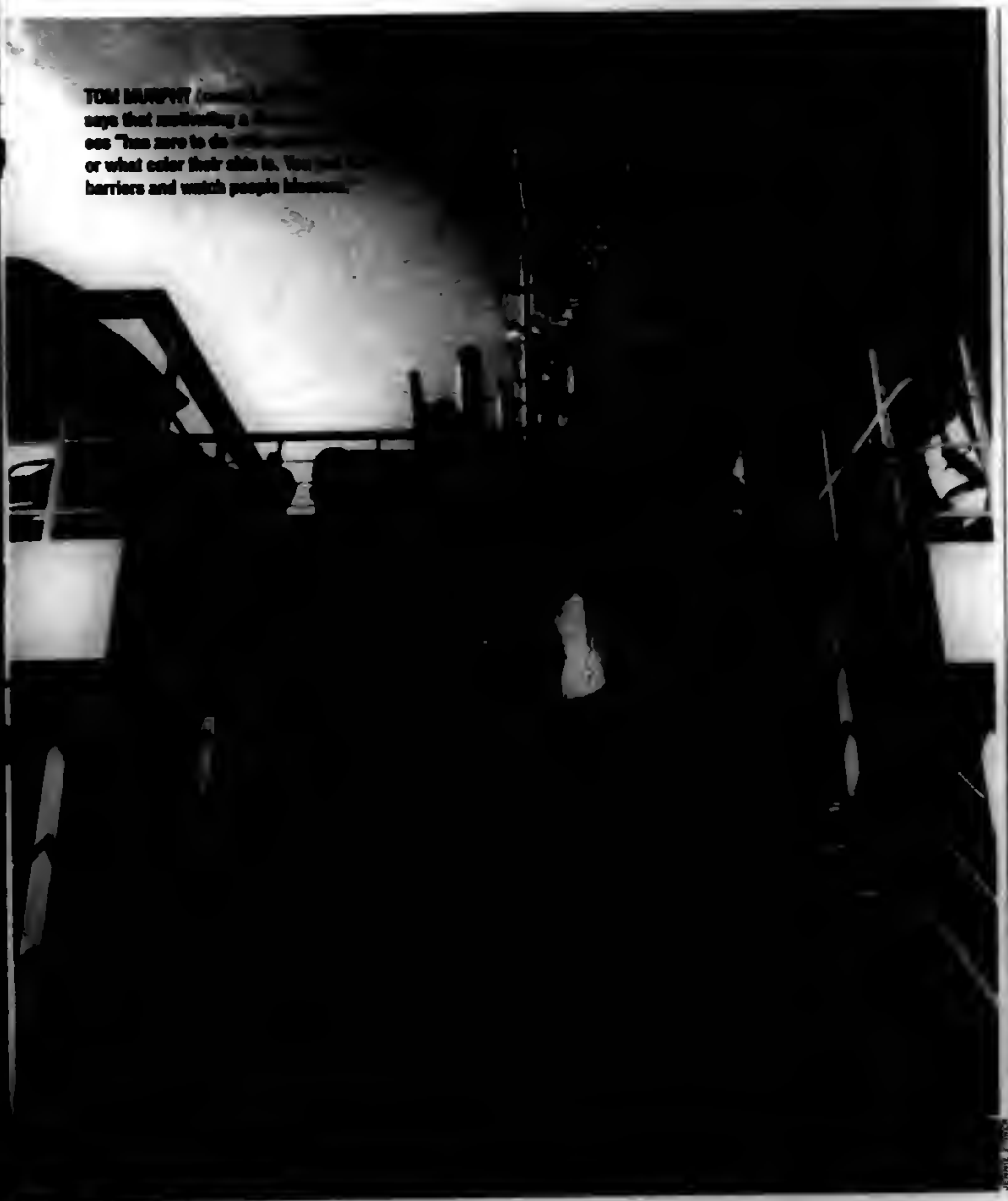
"You see him almost every day at the cafeteria, just chatting," says IT Director Julie Ponder. "He makes himself accessible."

"He interacts with everybody at the same level," says systems analyst Mike Korbini. "It gives me a warm feeling that he's taking the time to get to know me. And the way Tom interacts with employees, he sets an example. And it gets picked up."

Silo-busting. "Before Tom, there was more 'us vs. them' in IT — 'Everything for my group,' " Baker recalls. She notes, for example, that shipboard and onshore IT people didn't mix. "But now we're forced to work in cross-teams to bring out a product, and the result is to break down the silos," she says.

Motivation. "He knows at least 80% of the people in the department, and he adapts based on the person," Lopez says. "He can relate to what motivates them, rally people around him and get the staff to believe in what we're trying to accomplish."

"He's such a positive person, and he instills that," says IT manager Illeana Gonzalez. "You see him



n Deck

with this positive energy, and that goes out to the environment."

Trust. "We don't have to check back every 10 minutes," says Baker. "It used to be 'Don't breathe without getting permission.' Now, it's 'You know the parameters; do what you think is best.' "

With authority comes responsibility. "You're held accountable for your decisions," Wright says. "You're going to be helped through the bad ones and recognized for the good ones."

Murphy strikes the right balance between nurturing his people's independence and growth and supporting them. "I never get the sense he's looking over my shoulder," says Ponder, "but I do have the sense that if I look behind me, he'll be there, championing my cause. It's very empowering."

Metrics and time. Murphy has established very specific performance measures to let his managers know exactly what's expected of them. He's also centralized administrative responsibilities to give managers more time for their people.

"We used to spend a lot of time with vendors and [make] arrangements for training and travel," says Gonzalez. "All that was removed and given to other areas so that we could focus more on the people."

Respect. "The change has been profound," says Goldstein, no longer vitriolic. "I give Tom tremendous credit for turning around the organization and making it extremely service- and customer-oriented. Instead of being seen as an obstacle, it's seen as an assist to business."

This new respect makes the IT team proud of itself. "We have a great working relationship with the business now," Lopez says. "They respect us, they look to us, and that raises morale on the staff."

Murphy fosters IT pride with team-building activities. IT staffers paint and do landscaping at the Broward County Children's Society Home, clean up local creeks and help build a house each quarter with Habitat for Humanity.

Fun. "He's a funny guy, and his sense of humor adds to his ability to bring diverse people together," says Ponder. "He's always trying to get us to ease up and relax."

"He's just himself," says Lopez, "and that lets people be more themselves and have some fun while getting the work done."

Leadership. "He's not just a leader; he's a role model," says Ponder.

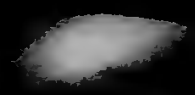
And he has modeled the concept that everyone leads and everyone works. "If there's work that needs to be done — even at a lower level — he rolls up his sleeves," says Gonzalez. "He'll get in there and help."

For instance, Bernard Gay, vice president of IT, says he once found Murphy moving equipment with a dockside crew to speed up the processing of cruise ship passengers. "Tom is not afraid to help," he says, "and so I have to get down and dirty to deliver, too. There are no excuses here."

"Tom's not a good IT leader; Tom's a great leader," says company President Williams. "People really love this guy. Someday he will be the president of a company, and it will be a great company to work for."

Quick Link To find out how Tom Murphy rallied his IT troops after a devastating layoff announcement following the Sept. 11 attacks, visit the *Computerworld* Web site: www.computerworld.com/t/127348

You're about to stick your neck out on a



server decision thot will finolly updote your doto center. The problem is, it's hord enough predicting whot will hoppen next quorter, let olone next yeor. So how con you be confident thot the infrostructure choices you moke today ore choices you con live with tomorrow?

One option now hos to include the new HP server rp8400—o rock-optimized breakthrough designed specificolly to help you monoge the enormous infrostructure demonds generoted by todoy's constontly evolving business environment.

It's smoll enough to fit two to a rack yet provides unprecedented power ond flexibility in o mid-range server. In fact, we've mode room for up to 16 processors, setting new stondards in the category for both performance density ond scolobility. The kind of power you need to more easily monage ond control workload ollocotion.

Best-in-closs dynomic portitioning essentiolly divides the server into sections, ollowing each one to function independently. So even if one opplication goes down, the other sections of the server continue their jobs unoffected. Which mokes it possible to move resources oround without having to shut down your entire system, sidestepping costly downtime.

And with the convenience of HP Utility Pricing, processing power ond other services con be mode avoiloble on top, like electricity. So you con easily ond securely scole online without hoving to invest in expensive hordwore or support.

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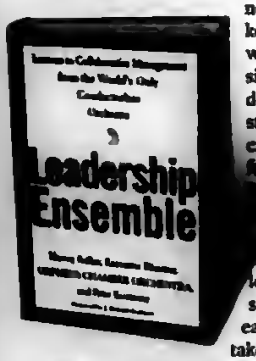
Managing Einsteins And Leaderless Teams

New tomes on how to motivate and lead whiz kids, guide a 'conductorless' IT team and manage projects.

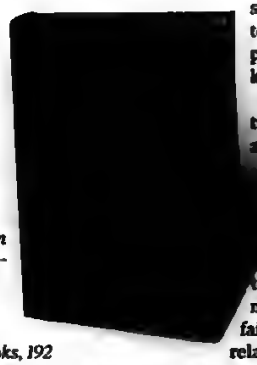
Leadership Ensemble: Lessons in Collaborative Management From the World's Only Conductorless Orchestra, *by Harvey Seifter and Peter Economy with J. Richard Hackman (Times Books, 225 pages, $25).* On the surface, the Orpheus Chamber Orchestra in New York appears to be leaderless. There is no conductor keeping tempo with a baton to signal crescendos from the strings or decrescendos from the brass. But the orchestra is far from leaderless, as Hackman learned from studying how each member takes responsibility for ensuring that musical passages are cohesive and that no single section drowns out the other.



There's a certain kind of democracy demonstrated here from which IT managers and technicians alike can draw lessons. Just as members of a project team can, Orpheus musicians recognize that there are differences among players in their experiences, musical perspectives and abilities. In Orpheus, a player's input in a musical decision isn't based on age, gender, position or how loudly he speaks. It's determined by what he has to offer to the music.

Seifter, the executive director of Orpheus, and Economy, the author of *Managing for Dummies*, do a deft job of drawing analogies to other companies, such as New York-based J.P. Morgan Chase & Co., which grants employees wide-ranging autonomy to pick and choose from the company's many products and how they're presented and sold to clients. There are plenty of practical tips on how to foster "horizontal teamwork" and deal with issues such as aggressive employees who "hijack" the team process.

— Thomas Hoffman



The Project Manager's Partner: A Step-by-Step Guide to Project Management (2nd edition), *by Michael Greer (Amacom Books, 192 pages, $24.95).* The recession has put its share of pressure on IT organizations, especially in the form of requiring more disciplined project management. This, Greer's third book on the subject, is especially focused on rookie project managers.

The book covers project management from soup to nuts and is dotted with several easy-to-understand forms and tables that can guide you through a project. It also offers questions for readers to answer in order to determine whether a project has passed certain checkpoints.

Don't skip the introduction: Reading it can help you pick out the parts of the book you may feel you *need* to read, given your project management experience — or lack of it. Also, check out Appendix E, which outlines six guidelines that can help you decide whether to kill a project. After all, if a project merits a death sentence, there's no sense in wasting your company's money today.

— Rick Saia

...ess Is a Contact Sport, *...om Richardson and ...gusto Vidaurreta with ...om Gorman (Macmillan Publishing USA, 256 pages, $24.95).* As youngsters, we were always told by our parents to play nice with other kids.

In business, it still turns out to be good advice.

To be successful, ...eed to get along ... customers, sup... ...rs, vendors, em... ...loyees and competi... ...ors, be aware of their needs and serve them fairly to maintain those relationships.

That's the premise of this book, a how-to guide to improving your business communications with others through effective relationship asset management.

The problem is, it may not take a 256-page book to remind you of such basic ideas. The authors write as though they're the first to realize that kind words and dealings do much to help keep business relationships sound. Even worse, the ideas are presented using deadly, tired football clichés, from a "playbook" to "thinking like a player" and offering summaries as "postgame wrap-ups."

— Todd R. Weiss

Managing Einsteins: Leading High-Tech Workers in the Digital Age, *by John M. Ivancevich and Thomas N. Duening (McGraw-Hill Professional, 251 pages, $24.95).* Many people regard Albert Einstein as the greatest scientific mind of the 20th century. In addition to his intellectual superiority, Einstein was recognized as an outspoken critic of bureaucracies. Much like their predecessor, today's Einsteins are highly intelligent, possess revolutionary ideas and abhor authority exerted over them by bureaucratic managers.

The authors, who are professors of management and entrepreneurship, respectively, at the University of Houston, do a credible job of offering suggestions on how to profile, recruit, motivate, reward, lead and even discipline Einsteins.

Though Ivancevich and Duening draw on a fair amount of clinical research and insights from experts such as *The Wall Street Journal*'s Sue Shellenbarger, some readers might be put off by some of the sweeping generalizations the authors use to classify the makeup of an Einstein: "Einsteins love novelty . . . Einsteins are puzzle solvers . . . Einsteins become bored with routine." Who doesn't?

Still, there's a lot of practical advice based on different management methodologies, such as balanced scorecards that should help IT managers who are struggling to manage and lead the latest crop of whiz kids.

— Thomas Hoffman

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KATHLEEN MELYMUKA/DIVERSITY

The Glass Ceiling: Barrier or Challenge?

I'VE ALWAYS BEEN STRUCK BY how neatly many IT women seem to fit into one of two categories that I call "Woe Is Me" and "Says Who?" When women in the first group bump against perceived gender barriers — the condescending boss, exclusion from the boys' club or the fact that no woman has ever led a big project — they whine. Those in the second group perceive those barriers as challenges and overcome them.

This isn't to condone gender bias in IT or to recommend that we ignore it. But it has always been fascinating to me the way some women seem to fixate on these barriers, while others focus on the goals beyond them.

I was recently reminded of this dichotomy by a new study from Catalyst, a New York-based nonprofit research firm dedicated to advancing women in business.

The report, "Careers in High Tech: Wired for Success," was based on comprehensive interviews with 19 women and 11 men considered to be part of the current and next generations of IT leaders at 10 high-tech companies, including AOL Time Warner, Hewlett-Packard, Oracle, Nortel Networks and Yahoo.

Here's what these IT leaders look like: The majority are 40 to 44 years old (seven are under 35). Twenty-seven have bachelor's degrees, and 14 have graduate degrees. Eight are minorities, but none is black or Hispanic. Eighteen have children.

Most report directly to the CEO or the level immediately below. They have titles like group product director, vice president of software development, group manager for optical Ethernet, senior technical director, vice president of global services, and vice president of strategy and corporate operations. These are people who are making things happen in U.S. technology.

Catalyst had hoped to shed some light on common career paths of successful women in IT. Instead, it found that the women themselves discouraged that kind of approach. Most warned against a preconceived set of steps, saying that the IT industry is changing too quickly for any preplanned strategy to work. In fact, the study busted the myth that the most successful people plan their careers. It turns out that some plan, but most don't.

The study also found that a technical degree isn't a prerequisite to success in IT. Fewer than half of the IT leaders who participated in the study have math, engineering or computer science degrees. So the fact that young women tend to shy away from technical studies — long used to explain their absence from IT's executive ranks — may not be such an important factor, according to the Catalyst report.

"There is no necessary or preferred starting point for careers in high tech," the study reports. "Several went direct to the goal, others followed a circuitous route, [and] still others began their careers through discovery and experiment."

Though they couldn't come up with a road map, male and female IT leaders agreed about how to power yourself down whatever road you take. While IT men often gain these types of insights from mentors, women — who often lack mentors — may not. They suggested the following:

- Dig deep into your chosen area of expertise in the first five years of your career.
- Build a track record in a given functional area and establish your credibility.
- Learn to manage a small group.
- Increase the scope of your people management skills, the size of your team and the complexity of the task for which you are responsible.
- Consciously explore other functions.
- Gravitate toward the visible, difficult, strategic tasks.
- Deliver, deliver, deliver. Performance and results are paramount.

Participants also talked about the importance of flexibility and social networks. They said IT is an open and fluid environment, so you need the flexibility to jump in when you see opportunities. Keeping in touch with past employers and colleagues is critical, they said, because you can never tell where that next opportunity is going to come from.

Many of the respondents said that finding a mentor is the key to discovering how the system works. With the benefit of 20/20 hindsight, the women said they would have done some things differently.

"I would have learned how to work the system sooner," said one. "I didn't understand the importance and power of politics," said another. "I could have been far more effective in using networks. I could have better understood how to use or get resources."

But among all these interesting insights, the one I was most struck by was how women who are IT leaders reacted to the glass ceiling: They either turned what some would perceive as disadvantages to their advantage, or they simply refused to accept the barrier.

"For much of my early career, I was the only woman," said one. "But it was always an opportunity for me. It gave me a level of visibility that I wouldn't have had."

Another woman said that the glass ceiling is "like an invitation with me. If someone says, 'You can't do that,' then I go [do it]."

These are the attitudes that make an IT woman into an IT leader, and these women's successes prove it.

EXECUTIVE TRACK

CDW Computer Centers Inc., a customized-technology provider, has named **JONATHAN J. STEVENS** its CIO. Stevens will be responsible for overseeing the Vernon Hills, Ill.-based company's IT and e-business strategies.

Stevens joined CDW as vice president of IT in July last year. Before that, he served as regional technology director at Avanade Inc., a Seattle-based technology integration company formed through an alliance between Microsoft Corp. and Hamilton, Bermuda-based Accenture Ltd.

Irvine, Calif.-based Mazda North American Operations recently announced the appointment of **JAMES A. DIMARZIO** as its CIO and director of IT.

DiMarzio was most recently senior vice president and CIO at Agency Holding Co., where he was responsible for the management of information systems for two companies. Prior to that position, he was general manager of IT at Lanham, Md.-based Land Rover North America Inc.

Le Meridien Hotels and Resorts in London has appointed **JAMES LAMB** its CIO.

Lamb has spent the past 12 years at Dallas-based Parot Systems Corp., where he most recently served as site manager of the company's Reston Development Centre in Reston, Va.

Lamb's previous experience at Parot includes the management of Westin Hotels & Resorts' worldwide technology center in Salt Lake City.

He also led the development of a new central reservation system for Tulsa, Okla.-based automobile rental companies Dollar Rent A Car Systems Inc. and Thrifty Rent-a-Car System Inc.

FirstEnergy Service Co., a subsidiary of FirstEnergy Corp. in Akron, Ohio, has promoted **KEVIN J. KEOUGH** to the position of senior vice president responsible for information services, performance planning, supply chain and telecommunications.

Ali Jamshidi, FirstEnergy Service's CIO, will report to Keough. Keough previously served as vice president of e-business strategy, business planning and unregulated ventures at the energy services provider.

In his new role, Keough will report to CEO H. Peter Burg. Prior to joining FirstEnergy, Keough worked in the Cleveland office of New York-based McKinsey & Co., a management consulting firm.

As a partner in McKinsey's electric power and natural gas practice, Keough assisted clients with strategic, operational and organizational issues.

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Dear Career Adviser:

I'm preparing for a layoff. What do I need to do to make sure I wrap up my current situation before I move on?

— LOOKING FORWARD

Dear Forward:

Here are some tips from a variety of folks who have already gone down this road:

Begin by documenting the dollar amounts owed to you concerning wages, bonuses, commissions, overtime and vacation pay. Document your retirement monies, making sure that any payroll deductions for your retirement plan and 125C cafeteria benefits plan have transferred over to your individual retirement and benefits accounts and that they aren't stuck in company coffers. Also, document any stock or other awards, including stock vesting schedules. Be sure you know and have direct contact with your company's 401(k) administrator, have confirmed that your health insurance is in force and will continue under COBRA, and have access to any outplacement services the company is providing.

Get all of this, as well as a written payment schedule regarding when to expect your checks, in writing, and have the company sign off. Then head over to the state unemployment office, making sure the company backs your claim.

Before your final goodbye, collect personal information from colleagues so you can generate the appropriate references and trade leads, and check with your attorney regarding whether the noncompete agreement that you signed when you joined the company still applies if you're being let go.

PAM GUTTER, is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

Dear Career Adviser:

I'm a senior programmer/analyst with 12 years' experience in IT, all in mainframes. I update my skills every year in areas including Visual Basic, MSAccess, PowerBuilder, HTML, Active Server Pages, Java and Oracle PL/SQL. But I have yet to find a position where a newbie is accepted. What skills should I pursue, and how do you see the mainframe IT market in the next five years?

— MOSTLY MAINFRAME

Dear Mostly:

Companies have already finished converting from old legacy systems, and Y2k is over. And e-commerce jobs require real-world experience with Enterprise JavaBeans. Plus, you have lots of competition both from existing mainframe people and people who have real-world experience with newer skills.

"We haven't had a mainframe position in this area in a long time," says Brett Arnold, recruiter at CDI Professional Services in Springfield, N.J., who expects the mainframe market to continue to wane.

Realistically, your best chances now are in situations that others might not want. But what you're looking for is an entry point that's your opportunity for an upward move.

If the company is converting older applications, volunteer to be on the team. Take courses at schools that guarantee internships and placement, and upgrade your skills, your understanding of business and possibly even your appearance. ◗

WORKSTYLES

Building on IT At Barton Malow

Phil Go, CIO at Barton Malow Co., talks about how IT workers fit into a major construction firm.

Being in the construction field, is there anything unique about your actual workplace? "We just moved to a new headquarters designed by our internal architectural firm and built by Barton Malow, and it's a showcase of what we do well. When you walk in the building, there's a four-story atrium, and it's so bright — especially in winter, when we're lucky to get a couple hours of sunshine. We also face the wetlands, with a long boardwalk that allows you to enjoy it.

"The building was also designed with a telephony infrastructure that uses IP, so when people leave me a voice mail or send a fax, I get it in my in-box."

What are the most critical systems supported or developed by your department? "One is our project management system. We have two versions: [application service provider]-driven and internally hosted. The second is our job-costing system, which is specific to the construction industry. Whenever either of those systems has a small hiccup, it's the end of the world."

What's unique about your IT department? "Part of our IT strategy is to be the best there is in the construction industry, which tends to be a bit stodgy when it comes to technology. We just finished putting together a data collaboration system using PictureTel technology. Not only can you see each other when you talk on the phone, but there's [also] a second monitor that's a PC, which allows project managers and marketing people to collaborate on things like proposal development. It's impressive to clients."

How would you describe the pace of the work? "Extremely hectic but fun. You have to do whatever it takes to get the job done, within reason. One thing I pride myself on, though, is I'm very sensitive toward peoples' personal lives. For me, work is not a place — it's an activity. You don't have to be in the office to get your work done."

How would you describe the overall culture of IT at your company? "Somewhere in between casual and formal. A few years ago, Barton Malow was a very conservative firm, and people dressed that way. When I started, the IT staff asked me if we could go to business-casual dress, and we were able to do that. But we're not too formal — the leaders here are very approachable, and we foster an environment that makes it a fun place. We do things outside of work — I got married a year and a half ago, and I invited the entire staff."

What aspect of work do you look forward to each day? "It's very rewarding when you introduce a new type of technology to a stodgy company and see the light bulb go on, even though it sometimes takes three or four tries before they say, 'Oh, this makes sense.'"

What aspect do you dread each day? "The corollary — that sometimes it takes three or four times for them to get it. That can be frustrating."

Barton Malow Co.

Who they are: A $1 billion construction management firm.

Main location: Southfield, Mich.

Number of IT employees: 25, with roughly half in application development and half in tech support

Interviewee: Phil Go, CIO

– Mary Brandel
thebrandels@hotmail.com

THIS WEEK

FIELD REPORT: NAS

Network-attached storage (NAS) is no longer an ad hoc, departmental storage add-on — it's becoming a serious top-down enterprise storage resource. We take a multifaceted look at the technology. PAGE 40

EMERGING TECHNOLOGIES

The new iSCSI standard paves the way for IP-based storage-area networks (SAN), but don't boot Fibre Channel from the data center yet. Performance, stability and interoperability are still evolving, as are IP SAN management tools. PAGE 44

HANDS ON

Virtual machines that can concurrently host multiple operating systems may reduce your backup equipment and software costs by as much as 70%. The downside? A slight performance hit. PAGE 46

QU

Think of netiquette as rules of good behavior adapted for electronic communications via e-mail, instant messaging, chat rooms and discussion forums. Find out more in this week's primer. PAGE 48

SECURITY JOURNAL

Mathias Thurman's token-based access system may protect his company's e-commerce site, but the network engineers oppose it. Should he give in or fight? PAGE 50

MONICA MELNYCHUK

NICHOLAS PETRELEY

No .Net Advantage

NOW THAT Visual Studio .Net has launched (on Feb. 13 — that wasn't a Friday, was it?), will someone remind me why .Net is destined to revolutionize Web services?

Let's look at what .Net brings to the table. First, .Net relies on standards such as XML, SOAP and UDDI to make it easy for networked objects to discover other networked objects and communicate with them.

Second, the .Net framework is programming-language-neutral. The .Net environment includes the Common Language Runtime and the Common Intermediate Language, also known as Microsoft Intermediate Language, abbreviated MSIL or IL, depending on the time of day. This acronym soup makes it possible to combine C#, C++ or Visual Basic .Net (VB.Net) programs as if they were all written in the same language. In other words, the moron down the hall who can't learn anything more complicated than Basic can write VB.Net programs that make direct references to classes and methods in your C++ program.

Third, Microsoft says it gives you all the tools you need to help you create "platform-independent, standards-based, language-neutral" .Net Web services. For example, you get tight integration with Microsoft's Internet Information Server (IIS) and built-in access to HailStorm, Passport and other Microsoft services.

Fourth, we have Visual Studio .Net itself. This integrated development environment supports Microsoft's C#, C++ and VB.Net and is decked out with handy tools to help you create Windows-specific front ends for .Net applications.

Let's see if we can figure out which of the above features is most likely to revolutionize Web services.

Unless you were born yesterday, I'm sure you realize that *Web services* is just a trendy term for distributed computing. Back when we called it distributed computing, the Common Object Request Broker Architecture (CORBA) seemed to be the ideal foundation. You can use any language you want to create CORBA objects, and CORBA is truly multiplatform, as opposed to ActiveX, which is Windows-centric.

Then came Java. Java's platform neutrality made it highly scalable, but Java's early answer to distributed computing was a primitive feature called Remote Method Invocation. This feature was easy to implement, which made it attractive despite the fact that it was a Stone Age tool compared with CORBA. It almost looked as though CORBA would make a comeback when Sun added CORBA-based Internet InterOrb Protocol support to Java. But the protocol proved to be harder to learn and implement than XML, SOAP and UDDI. As a result, Java developers seem to be going with XML, SOAP and UDDI.

Back to .Net. What is it about .Net that will revolutionize distributed computing? Its language neutrality? Integration with Microsoft software and services? The Visual Studio .Net development environment?

Given the choices programmers have been making so far, it's difficult to imagine that they will switch from a platform-neutral, single-language, highly scalable solution like Java to a single-platform, multilanguage solution with limited scalability. (Microsoft is marketing .Net as multiplatform, but anyone who believes that should revisit the issue after sobering up.)

Language neutrality is cool, but as nifty as it might be to be able to reference a C++ class directly from a VB.Net program, the more languages you add to a project, the more difficult that project is to maintain. But there's one simple reason why you can be sure language neutrality won't revolutionize Web services: It has nothing whatsoever to do with Web services.

What's left? Considering Microsoft's less-than-stellar reputation for security, I don't think developers are going to flock to .Net because it's tightly integrated with Microsoft IIS and Microsoft services such as HailStorm and Passport. So it's safe to cross that feature off the list.

NICHOLAS PETRELEY is a computer consultant and author in Hayward, Calif. He can be reached at [illegible]

And no matter how terrific the visual tools may be, it's hard to believe a glorified text editor could revolutionize Web services. So I think we can eliminate Visual Studio .Net as the answer.

That leaves the fact that .Net supports XML, SOAP and UDDI. Of all the features of .Net, that support is what has the potential to revolutionize Web services. Problem is, these standards existed before .Net, and you don't need .Net to use them.

So will someone remind me why .Net is destined to revolutionize Web services? ●

Overview

Network-Attached Storage

Network-attached storage (NAS) is quietly transitioning from an ad hoc, departmental storage add-on to a serious top-down enterprise storage resource. This highly reliable file server approach has always been relatively inexpensive and easy to configure and manage. But now, a single NAS server accommodates tens of terabytes of data, and NAS systems sport more efficient backup technology and support applications more efficiently over today's faster Gigabit Ethernet networks. What's missing? Better tools to manage across distributed NAS resources.

By Robert L. Mitchell

Bigger and Bigger

TECH CHECK

WHILE STORAGE-AREA networks (SAN) have been getting all the attention, network-attached storage (NAS) has been quietly breaking all the rules. Essentially a plug-and-play disk storage subsystem with embedded file-serving software, NAS technology was originally seen as an easy way to add a few hundred gigabytes of storage to a LAN. Two years ago, such boxes might have scaled to 0.5TB. Today, a single NAS system may support as much as 30TB.

Data backup was supposed to be a big problem for large NAS devices due to network congestion. But thanks to adoption of the Network Data Management Protocol standard and technologies such as Sunnyvale, Calif.-based Network Appliance Inc.'s SnapShot feature (which creates a copy, or "image," of the file system and associated disk block mappings), that's changed. Today, you can run NAS backups over high-bandwidth Gigabit Ethernet networks quite efficiently.

NAS devices have traditionally served up files to end users, while SANs have allowed application servers to access disk storage without a server intermediary and send it in efficient block-data format over Fibre Channel, a dedicated, high-speed serial interconnect. But NAS is now well established for adding capacity to e-mail servers, Web server farms and SQL and Oracle databases, where clusters of NAS devices can increase availability and throughput.

Data center applications such as online transaction processing still work better on SANs, which offer high scalability and faster performance, especially for large files or where storage traffic is heavy. But even "some block-level applications, like an Oracle or IBM DB2 database, are adopting a file system to replace the block storage technique," says Jon Toigo, an independent storage consultant in the Tampa Bay area. "There is a certain convergence going on, and NAS is well positioned to take advantage of it."

NAS servers are relatively easy and inexpensive to install, and users say they've been highly reliable. "NAS is great because you can distribute it all over the place, and you can manage it from one location," Toigo says.

NAS is not without its limitations, however. Most servers use a Web management interface, which works fine for a single device. But as the systems reach capacity, administrators must add new NAS systems. The problem: "You've got to surf the [individual] Web pages associated with each NAS box to maintain them. That's a hassle," says Toigo.

Then there's storage virtualization. A single NAS server allows multiple disks to appear as a single virtual storage volume to end users and application servers. And administrators can add hot-pluggable disk drives to the system and expand the virtual volumes on the fly, without disrupting applications using them. But these volumes typically can't span multiple NAS servers, let alone work with other vendors' NAS devices, and that limits scalability. A few startups have begun offering that capability, but the technology hasn't yet trickled up to the market leaders.

"NAS is a great out-of-the-box solution, but you don't have a lot of options in configuring it," says Mike Carrato, a partner in Accenture Ltd.'s New York office. That's one reason organizations aren't loading anywhere near 30TB on a single NAS device today. But users are looking for new ways to use this relatively inexpensive, high-capacity storage, and vendors are looking for new ways to accommodate them. Ultimately, analysts say, IP SANs will offer a single, virtualized storage pool for both NAS and SAN functions. Until then, users will have to make do with SAN/NAS hybrids like IBM's NAS 300G, which places a NAS front end on an IBM Shark Fibre Channel SAN to convert client file requests to block data requests. ▶

NAS Finds I

Getting Big Files Into a Small Box

CASE STUDY

Who they are: A $2 billion independent oil and gas exploration and production company.

Goal: Allow geologists and geophysicists to share 1.5TB of seismic data files; consolidate backup of seismic data and an Oracle database; improve backup performance; accommodate the purchase of large quantities of additional seismic data files with minimal disruption.

Challenges: An existing 5-year-old NAS device maxed out at 1TB using older 9GB disk drives. Growth in data storage needs was stretching backup times. The amount of floor space available to accommodate more boxes was limited.

Strategy: Replace existing NAS unit with Auspex Systems Inc.'s NS 3000 NAS device with 2TB of capacity; migrate to Veritas Software Corp.'s NetBackup version supporting the Network Data Management Protocol (NDMP); migrate Oracle data to NAS; deploy everything on Gigabit Ethernet.

Issues: Performance differences were a key differentiator in choosing a NAS device, says Patrick Murphy, manager of IT. "Typically, seismic data comes in 40 or 50MB files," he says. By working with peer organizations and running comparative tests using his applications, Murphy found that performance varied by as much as 20% for his application mix.

Advice: Compatibility counts. "You have to be concerned that the backup software, filer head and backup hardware will work together," Murphy says.

Payoff: The new system provides more storage in a smaller footprint and allows volumes to scale to 10TB without interruption. Performance improved 10% to 20%, and backup times were cut in half. "The newer box supports NDMP," Murphy says. "It dropped our backup time by more than 50%. . . . That's mostly attributable to NDMP."

ts Niche

Storage Appliances: Not All Plug and Play

FIELD NOTES

DON'T TELL DAN ROSMAN that NAS devices just plug and play. His first clustered NetApp servers from Network Appliance Inc. wouldn't work with his warehouse application server, until he discovered that the HP-UX-based system needed a patch to rectify compatibility problems with the Network File System (NFS) file-sharing software the NAS server uses.

After that, Rosman, IT director at Fairfield, Calif.-based Jelly Belly Candy Co., ran into trouble configuring storage virtualization. The NetApp server presented its storage as a network file share, but the Oracle database software and warehouse management application wanted a drive letter. Rosman mapped the drive letter to the new share-name, but "every time a user would log off, it would break all those mappings and the system would stop working," he says. He ended up going through the registry settings for the Oracle software and the application and removing all references to the drive letter. (Network Appliance says it now lets the NAS appliance appear as a drive letter.)

Rosman then set up NetApp's SnapShot feature, which takes a snapshot image of the file system and data every four hours, allowing for rapid rollback in the event of data corruption. But the multiple images take up valuable disk space. Rosman would like to take snapshots of other applications in the same volume only once a day, but the technology won't support that.

Recently, Rosman had a snapshot problem that resulted from administrator error. "Instead of letting the system do it, we took some manual snapshots and left those in the production volume," he says. Those images continued to consume more disk space until "we filled up one of the filers and the database stopped." Rosman had decided to pass on Network Appliance's monitoring software in favor of a plug-in for his HP OpenView management software, but he hadn't yet implemented it.

Rosman says the NetApp file servers are "very easy to manage." He says he also found support and performance better than with server-attached storage, thanks in part to NetApp's 1GB cache. But appliance or not, the system requires careful management when used for mission-critical applications.

Quick Link: For more information, including a Q&A with consultant Jon Toigo, a collection of tips for NAS installation and management, and an extensive resource list, visit our Web site: www.computerworld.com/cwfr0309

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NAS by Class

COMPETITORS

Enterprise-class NAS: For enterprise-class network-attached storage, EMC Corp.'s Clarion and Network Appliance Inc.'s NetApp filer servers still rule. The devices can scale to nearly 30TB and offer the most advanced management tools – including the ability to work with enterprise network management tools like Computer Associates International Inc.'s Unicenter TNG and Hewlett-Packard Co.'s OpenView. "EMC has the leading storage management software in Control Center. They're very well placed to serve whatever you need to do – if you can afford them," says Mark Roberts, principal of Dataphile Consulting in Austin, Texas. These vendors also offer enterprise-class support programs and proven reliability.

Departmental filers: Filer servers from vendors such

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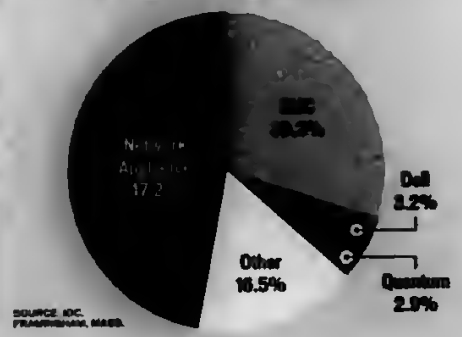
as Quantum Corp. and Maxtor Corp. offer an easy way to add inexpensive storage in remote offices, departments or small to midsize businesses. They're good for adding a quick 300GB of storage on a departmental LAN but are more unwieldy to manage as the number of NAS servers grows. If you're using NAS devices to consolidate Windows servers, look for systems that use Microsoft Corp.'s Common Internet File Services (which supports Active Directory) rather than the Unix-based Network File System.

The innovators: Start-ups are the great innovators in NAS technology. For example, LeftHand Networks Inc. in Boulder, Colo., and Tricord Systems Inc. in Plymouth, Minn., can virtualize and centrally monitor storage across multiple NAS servers, creating highly scalable storage systems that can be distributed for greater fault tolerance. And Tek-Tools Inc. in Dallas is working on XML-based agent technology that will allow management of multiple vendors' NAS boxes from a single management screen.

NAS Market Leaders by Revenue

Network Appliance and EMC captured the lion's share of the $1.8 billion worth of NAS appliances sold in 2000, although Quantum led in unit shipments due to volume sales in the low end of the market.



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DON'T TELL DAN ROSMAN that NAS devices just plug and play. His first clustered NetApp servers from Network Appliance Inc. wouldn't work with his warehouse application server, until he discovered that the HP-UX-based system needed a patch to rectify compatibility problems with the Network File System (NFS) file-sharing software the NAS server uses.

After that, Rosman, IT director at Fairfield, Calif.-based Jelly Belly Candy Co., ran into trouble configuring storage virtualization. The NetApp server presented its storage as a network file share, but the Oracle database software and warehouse management application wanted a drive letter. Rosman mapped the drive letter to the new share name, but "every time a user would log off, it would break all those mappings and the system would stop working," he says. He ended up going through the registry settings for the Oracle software and the application and removing all references to the drive letter. (Network Appliance says it now lets the NAS appliance appear as a drive letter.)

Rosman then set up NetApp's SnapShot feature, which takes a snapshot image of the file system and data every four hours, allowing for rapid rollback in the event of data corruption. But the multiple images take up valuable disk space. Rosman would like to take snapshots of other applications in the same volume only once a day, but the technology won't support that.

Recently, Rosman had a snapshot problem that resulted from administrator error. "Instead of letting the system do it, we took some manual snapshots and left those in the production volume," he says. Those images continued to consume more disk space until "we filled up one of the filers and the database stopped." Rosman had decided to pass on Network Appliance's monitoring software in favor of a plug-in for his HP OpenView management software, but he hadn't yet implemented it.

Rosman says the NetApp file servers are "very easy to manage." He says he also found support and performance better than with server-attached storage, thanks in part to NetApp's 1GB cache. But appliance or not, the system requires careful management when used for mission-critical applications. ▶

Quick Link For more information, including a Q&A with consultant Jon Toigo, a collection of tips for NAS installation and management, and an extensive resource list, visit our Web site: www.computerworld.com/q?a1010

Application Integration Forges Offshore Link

Refiner's project cuts training time, costs and billing errors. By Michael Meehan

Perfecting The Pipeline

The initial implementation of an EAI project to link Tesoro's docking facilities to its back end involved running SAP ERP applications in parallel.

HAVING TASTED SUCCESS with a limited enterprise application integration (EAI) project, Tesoro Petroleum Corp. was emboldened to tackle linking mission-critical information silos that had never exchanged data before.

A year ago, Mark Evans, CIO at the San Antonio-based oil refiner, faced a data dilemma in Tesoro's marine services division. The process of getting diesel fuel, drill lubricants and supplies out to the company's oil rigs in the Gulf of Mexico was fraught with errors. Wrong customer numbers, incorrect product numbers, taxation mistakes and a lack of proper documentation made it nearly impossible to track what the rigs had in stock or to pay Tesoro's suppliers in a timely fashion.

In February last year, Evans started a pilot project to link the billing systems for Tesoro's offshore operations to the corporate enterprise resource planning (ERP) system from SAP AG. Previously skeptical about the ability to forge such links, Evans has since been converted into an integration evangelist.

Evans decided he needed to bolt an HTML face onto an SAP back end so his wildcatters could worry about drilling for oil rather than learning the nuances of how to fill in forms on an SAP system. Evans chose Dallas-based integration vendor Fuego Inc. and set out to reduce what would be 13 to 15 screens of work in an SAP environment to three Web-based screens.

His first order of business was to create a separate SAP instance dedicated to handling orders for the offshore operations to run alongside the marine services division's existing SAP system.

"We wanted to make sure we weren't hammering our production and development environment, so we created a buffer," Evans says.

The new SAP instance required five new Windows NT servers. In addition, Evans' team had to coordinate LAN and directory services to make sure the field offices were sending information to the proper SAP instance before the information was imported into the marine division's main ERP system.

After six weeks, Evans had a parallel SAP environment and an HTML-based system that could execute up to 14 different SAP transactions. Fuego's proprietary component integration language translated the HTML pages into SAP business application program interfaces (BAPI).

Tesoro's EAI Pilot

Error rate: Dropped 60% for orders taken at docking facilities

Training time: Reduced from an estimated one year to one day

Project cost: Less than $100,000

Evans found that the error rate for orders taken at Tesoro docking facilities dropped 60%. Training for the field employees also took only one day instead of what Evans says could have been a year of trial and error with the ERP system.

All told, the project cost less than $100,000.

"Initially, when we went into this, you didn't know if you were going to have shelfware, but as it turns out, I particularly liked the ease of use," Evans says. "It really changed our thinking. Suddenly, integration wasn't a black hole that we wanted to stay away from. It stopped being this major technical problem.

"It's been a real cultural change," he adds. "Integration now is really part of every project we intend to do, and it's all based on the fact that it's easier to do."

Adding Layers

Although Tesoro sold its offshore drilling facilities after that project, Evans is now in the process of integrating the company's refinery control systems with the rest of its IT infrastructure. That 90-day EAI project is due to be completed this month.

Evans is creating an XML-based integration layer between Tesoro's refinery control systems and its SAP-based business IT infrastructure. Rather than use point-to-point data translation, Evans says, he wants to transform pipeline, tank-gauging and treatment data in XML documents that could then be distributed to Tesoro's accounting and business divisions.

"There's all sorts of safety and regulatory reasons to improve the flow of this data," Evans says. "Until now, we haven't been able to fully understand what went out and came in each day at the refinery level. Reconciliation has been a monthly process."

Part of the reason there hasn't been that level of monitoring is that refinery systems are largely proprietary, focused on the peculiarities of operating safely in a heavily regulated industry. Those refinery systems have been "firewalled off" from the rest of Tesoro's operations, Evans says.

He had been using a Windows NT server farm to act as a data historian for the refinery operation, but it has been little more than a repository. It hasn't been able to track real-time product movement, process variables or production schedules.

One of the reasons Evans chose an XML data format was that he wants to eventually be able to push data to business partners.

Evans says much of the work has centered on load-balancing his servers both in the refinery and business systems to make sure they don't crash when they begin swapping data. Business process rules for error-handling have also been a focus.

"You've got to make sure the right people get notified," Evans says.

And all this because he learned not to fear EAI.

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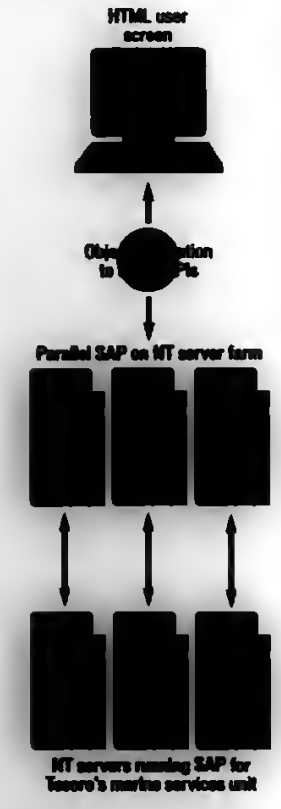

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Get Ready for IP SANs

BY ROBERT L. MITCHELL

IF A VENDOR CLAIMED TO offer a storage-area network (SAN) with the performance of Fibre Channel (FC) but without the cost and complexity, jaded FC administrators might be a hard sell. After all, FC network devices have been notoriously incompatible, expensive and complex to administer.

But IP SANs promise to change all that by implementing the Internet Small Computer Systems Interface (iSCSI) protocol, which enables SANs to operate over industry-standard TCP/IP and Ethernet.

The concept of storage networking over IP isn't new: Network-attached storage appliances have long delivered file services over IP using Network File System or other file-sharing protocols. But creating storage networks that allow highly efficient block-level transfers between application servers and shared storage pools has been the domain of FC networks — a switched, high-speed serial interconnect requiring specialized cabling, host bus adapters (HBA), switches and management software.

IP SAN architecture, an extension of existing SCSI and TCP/IP Ethernet standards, could reduce costs by creating a unified corporate IP network that's easier to design, integrate and manage than a traditional FC SAN. iSCSI networks are also compatible with IP-based security mechanisms such as Kerberos, public-key encryption and IPsec.

Setting up an IP SAN isn't simply a matter of plugging in iSCSI-attached storage, however. While an IP SAN can run on standard Gigabit Ethernet switches, the overhead involved in processing of TCP and the iSCSI protocol can quickly overwhelm the CPU in servers with significant storage network traffic. IT managers may need to replace standard Ethernet adapters with special HBAs called TCP off-load engines (TOE).

John Flynn, IT director at Minneapolis-based NRG Energy Inc., says he hopes to get by without TOEs. "None of [our] applications have high-performance I/O requirements," he says.

But Rick Halbardier, project coordinator for Washau County, Nev., will need TOEs for the IP-based tape backup SAN he's testing. "Backups tend to use all the CPU resources available to the system," he says.

Halbardier is optimistic about the emerging TOE adapters. But, he says, "I don't know that we can say it's going to be reliable until we've tested it."

It might not be compatible, either. Standards committees are hammering out iSCSI draft standards (the final version is expected this summer), but vendors are rushing products to market. There are no standards for TOE, different vendor interpretations of the iSCSI standard could lead to interoperability problems, and no certification process exists. And vendors have little credibility in the user community after the interoperability debacle with early FC devices.

Once the standard is stable, analysts predict, IP SANs will slowly replace FC, but users with an investment in FC are unlikely to change over soon. "You don't replace existing technology with emerging technology," says Dan Tanner, an analyst at Aberdeen Group Inc. in Boston, adding that FC now supports 2G bit/sec. speeds while Ethernet still maxes out at 1G bit/sec.

Initially, the best fit for iSCSI may be around the edges of the FC SAN, where its lower cost makes more sense. But early adopters might do well to emulate Flynn's pragmatic approach to IP SANs. By choosing FC storage arrays with an FC/iSCSI switch, he can move to FC if things don't work out. ▶

INFRASTRUCTURE	PERFORMANCE	BEST FIT TODAY
Can use existing Ethernet switches, network adapters and copper cabling	1G bit/sec., servers may require specialized TOE adapters	Outside the data center where FC SAN costs can't be justified
Requires special HBAs, switches and fiber cabling	1G or 2G bit/sec.	Critical data center applications where proven technology is a must

Quick Link For a user case study, a comparison of iSCSI with other storage protocols, a brief interview with Nishan System's Tom Clark and links to IP storage vendors, visit our Web site at www.computerworld.com/q?a1020

The Benefits Of Storage Over Ethernet

Q&A **Ahmad Zamer**, product line manager at Intel Corp.'s LAN access division in Austin, Texas, is chairman of the Storage Networking Industry Association's iSCSI subgroup. He recently talked with evaluations editor Robert L. Mitchell about the iSCSI protocol.

What is iSCSI good for? The main concept of iSCSI is to allow people to build storage-area networks using Ethernet. If you already have a large network that is built around Ethernet, it is natural to connect the storage to that network rather than having to learn new ways to deal with storage. Smaller and medium-size organizations cannot afford the cost of Fibre Channel SANs. We expect iSCSI to be cheaper and easier to implement.

What are the immediate benefits? The main benefit is the long operating distances that iSCSI will bring to the table. Right now, you have to jump through a lot of hoops to put your storage far away for disaster recovery. IP storage makes it doable.

When will the standard be final? We will create the document [this month], and it goes into a three-month review period. Then we go into the July or August meeting and expect that we will get out with a standard.

Does "standard" really mean interoperable? We want to make sure products interoperate. We do not want to see the consumers get stung again by another untested set of products that the vendors say are OK but when plugged in don't work together.

How will costs compare to FC? Lower training, lower cost of ownership. The management costs will be cheaper in terms of management tools and human resources. As the product matures, you'll be able to manage the network from one window.

Who should skip iSCSI? Where you do not need [iSCSI's] operating distances and you have already invested in FC, there is no point at this moment to switch to iSCSI.

PRODUCTS

Already To Market

A few iSCSI products are either available or will hit the market this year.

Target Devices

COMPANY: IBM
PRODUCT: TotalStorage IP Storage 200i, an iSCSI-based storage array that can support up to 3.5TB of data

COMPANY: Sware Inc.
Mountain View, Calif.
PRODUCT: Palisade IP storage array, supports up to 640GB

Storage Switches And Gateways

COMPANY: Cisco Systems Inc.
PRODUCT: SN 5420 Storage Router, allows direct attachment of FC storage devices onto an IP SAN
PRODUCT: IPS 2000 IP storage switch, connects legacy SCSI storage devices to a Gigabit Ethernet IP SAN

COMPANY: Nishan Systems Inc.
San Jose
PRODUCT: IPS 3000 Storage Switch, connects iSCSI and FC networks

COMPANY: Pirus Networks
Acton, Mass.
PRODUCT: Powerful "carrier class" multiprotocol storage switches that handle a large number of connections

iSCSI HBAs

Vendors plan to ship HBAs with TOEs and onboard SCSI off-load capabilities next quarter.

COMPANY: Intel Corp.
PRODUCT: Intends to ship an iSCSI HBA at half the cost of a typical FC HBA

COMPANY: Adaptec Inc.
Milpitas, Calif.
PRODUCT: Uses a full off-load application-specific integrated circuit on its ASA-7211 iSCSI Adapter, which it claims improves server performance by 30% to 50%

COMPANY: Alacritech Inc.
San Jose
PRODUCT: Implements part of the TCP function in a device driver, which allows its 1000x1 adapter to handle both iSCSI and normal TCP traffic

- Robert L. Mitchell

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Virtual Recovery Via Virtual Servers

A new approach to disaster recovery involves running multiple operating systems in a single backup server. By Howard Millman

IN AN IDEAL WORLD, disaster recovery strategies would include backup equipment ranging from a single server to an entire dark data center. In the real world, you can't afford to set up an entire extra data center that you hope you'll never use. At the same time, you can't ignore the need for real-time business continuity protection. Virtual machines that can concurrently host multiple operating systems may reduce your backup equipment and software costs by as much as 70%. The downside? Accepting a slight performance hit.

Virtual-machine-based server consolidation is a technology that's almost too good to be true. Its promised savings result from combining multiple servers and operating systems into one RAM-crammed, multiprocessor box.

The chief player in this market is Palo Alto, Calif.-based VMware Inc. Its virtual machine server software can run up to 20 operating systems concurrently — including all versions of Windows, from 3.1 to XP, and many flavors of Unix — in one physical box. VMware offers two virtual server products: GSX Server runs on Intel-based machines using Unix, Linux or Windows, while ESX Server contains its own base operating system.

Similar in purpose (but not structure) to an emulator, virtual machines create independent, isolated computing environments that include a BIOS, I/O systems (serial, parallel and Universal Serial Bus ports) and support for SCSI devices, as well as full network connectivity. For mixed environments, the software supports file sharing between Linux and Windows systems using Samba.

While the servers are virtual, the benefits are real: hardware savings as a result of server consolidation and reduced maintenance expenses. A reduction in your need for physical space may not yield a direct savings, but it can be an added advantage. Because virtual machines switch between operating systems in seconds and don't require a reboot, downtime in case of failure is measured in seconds. Also, if one system crashes, it won't affect any other virtual machines or the host server's operating system.

"As part of a disaster recovery plan, running independent multiple operating environments enables you to guarantee immediate data availability and integrity," says Jeremy Smith, president of Global Continuity PLC, a business continuity service provider and partner of VMware in England.

Liverpool, England-based beverage firm Halewood International Ltd. worked with Global Continuity to install two virtual servers using the Global Continuity/VMware technology. Halewood's objective was to reduce the cost of backup equipment and support and to locate backup equipment nearby for easy service and testing.

Before using Global Continuity's NeverFail backup software, Halewood's IT manager, Alec Stewart, backed up all of the company's data to a digital audiotape recorder and copied databases to another server each night. That made Halewood's data secure, but the company lacked real-time rollover capability in case of failure. Stewart says he also worried about data integrity and the system's ability to grow.

"The cost [for traditional disaster recovery options] was prohibitive," says Stewart. "We also looked at buying a warehouse and [outsourcing] the operation. However, the building acquisition cost and regular visits to test the equipment didn't make sense."

Stewart rolled out two dual-processor GSX Servers running under Windows NT, plus the NeverFail software. The virtual servers mirror the data stored in Halewood's primary line-of-business servers.

Preliminary savings look promising. "Overall, they are seeing a 70% reduction in costs using the GSX Server," says Smith. Halewood's one-time outlay was about $17,000 for server hardware and $20,000 for the NeverFail software, VMware's GSX Server and on-site consulting services. Halewood's systems now support more than 100 staff users, 600 corporate clients and thousands of private clients.

Although Halewood and most other customers use the system to provide zero-downtime rollover protection, Smith says the virtual machines can also run line-of-business applications and deliver the same cost-reduction and space-saving advantages they do for disaster recovery. What's more, a single-server configuration can host multiple copies of an operating system, each running an isolated application, Web server or database. This allows IT managers to use a virtual machine as a test bed to provide an extra margin of safety when testing new applications or sandboxing a potential virus.

No Free Lunch

Because these are machines in a machine, you may experience a 10% to 15% decrease in performance for GSX Server and about a 5% decrease in performance for ESX Server. Adding RAM and multiple processors will minimize the hit. Allocating RAM to each of the running operating systems, as well as other configuration options, is handled through a management console.

I tested VMware's Workstation 3.0, a desktop virtual PC running under Windows XP. I needed at least 512MB to run two virtual operating systems, Mandrake Linux and Windows 98. Each additional concurrent operating system requires another 512MB.

While virtual machines offer a long list of benefits, disaster recovery is all about getting your data back intact and your systems restored — fast. As part of an insurance policy you hope to never use, VMware's GSX and ESX Server do provide extra protection. That was the ultimate motivation for Stewart, who says, "We have never experienced a data loss in the past — and we want to keep it that way."

Millman is a writer and consultant in Croton, N.Y.

VMware Inc. Palo Alto, Calif. / www.vmware.com / (877) 486-9273

GSX Server

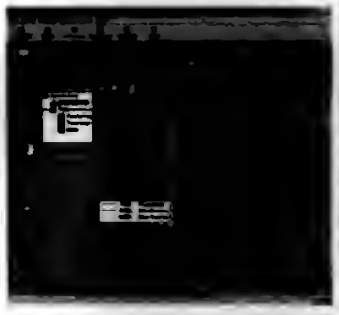
$2,500 per server, unlimited connections

For use in single-, two- and four-CPU machines, each running four to 16 virtual machines

ESX Server

Starts at $3,800 for a two-CPU server and rises to $10,000 for an eight-CPU server; unlimited connections

For use in four- and eight-CPU machines, each running eight to 20 virtual machines



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Netiquette

BY BRIAN SULLIVAN

A U.S. DEPARTMENT of Commerce report says that more than half the nation is now online. Thus, more people than ever before are meeting one another for the first time, chatting on a regular basis and swapping ideas and opinions with perfect strangers via the Internet.

A new set of do's and don'ts — rules of polite behavior — is springing up to augment the etiquette that rules our off-line behavior. This new netiquette has quickly become a universally understood behavioral standard that transcends cultures, businesses and geographical boundaries.

Here's a brief look at some of the rules of netiquette that are becoming the norm:

1. Don't lie about who you are. In *Computerworld.com*'s forums, one man recently took a very strong stance defending Microsoft. Other forum members accused him of working for a company that partners with Microsoft but not disclosing that fact. Members said they recognized the man's arguments and writing style from other forums. After the brouhaha, the offender apologized for causing trouble and vanished off the boards.

Vanessa DiMauro, *Computerworld.com*'s director of communities, points out another problem with a fake identity. People form relationships in discussion groups, and you don't want to end up in a position where you have to reveal that you're not the 24-year-old roller-skating blonde you said you were.

More important, DiMauro says, such a misrepresentation of identity is simply a violation of trust, and that's never good form.

DEFINITION

Netiquette is all about etiquette on the Internet. Think of it as rules of good behavior adapted for electronic communications via e-mail, instant messaging, chat rooms and discussion forums.

MONICA BENNETT-HUR

2. Know when to shut up. These days, it's hard to determine when a conversation is over, according to Joseph Cothrel, vice president of research at Participate Systems Inc. in Chicago. He says we've all been in instant messaging or e-mail conversations that just keep going on and on. Do you really have to say "You're welcome" to the guy who just said "Thank you"? Sometimes it feels like everyone is trying to out-polite one another.

3. Know when it's OK to talk. When you first show up at a discussion forum, it's not always a good idea to plunge right in, Cothrel says. Take a look around, and read the forum guidelines and other posts to see how the community fits together. Jumping in with a harsh opinion won't create a good first impression, and the Web, like life, is all about making a good first impression.

4. Check your grammar. More and more often in discussion groups, members are chastising people who use bad grammar or misspell words. Cothrel says that nothing kills an argument for him like seeing a simple word misspelled consistently. He says you have to wonder: If people can't spell, do they really know what they're talking about?

5. Don't ask about e-mail you just sent. Don't buttonhole someone in the hall or telephone him five minutes after you send a lengthy e-mail and ask him what he thinks about it. Give him a chance to read it, digest it and reply via e-mail. According to Cothrel, more and more people consider discussions about e-mail messages a waste of time.

6. Follow threads you start. When you start a thread on a discussion forum, especially if you asked a question, follow that thread. And if you solve the problem you asked about, tell the board. Likewise, Cothrel points out, if the advice you received from the other members led you to a solution, be sure to tell them.

7. Don't use instant messaging for long messages. Betsy Waldinger, vice president at Chicago-based OptionsXpress Inc., spends a lot of her day working on an online customer-service chat system that operates a lot like instant messaging. She says it's important to send short messages and to break up long ones over many screens. If you don't, she says, you force the people on the other end to wade through an overly long message — and you keep them waiting for an answer while you type.

8. Send a message before you drop in. At companies where instant messaging is part of the culture, Cothrel says, you should always send someone a note before dropping into his office. This gives the other person a chance to let you know if he's in the middle of something. It also saves you the trouble of walking over to his office only to find that he's gone home.

9. Log off instant messaging when you're not using it. I often leave my messaging program on when I'm not around and come back to find messages asking questions and other messages in which the senders ask why I'm ignoring them. One of these days, someone will send me an embarrassing message and there it will be on my computer screen, flashing for all to see. And it will be my own fault.

10. Never send an e-mail you wouldn't read in public. The night before his wedding, a Massachusetts state official sent a colleague an e-mail saying he wasn't sure he wanted to get married. Unfortunately, he hit Send All, and all state employees with e-mail accounts received the note. *Boston Herald* gossip reporters evidently received numerous forwarded copies, and they printed the message in the newspaper. Word is, the guy's fiancée married him anyway.

11. Think twice before forwarding e-mail. The jury remains out as to whether forwarding messages is acceptable. Obviously, it's sometimes necessary for business reasons, but people do it far more often than they need to. Philip Zimmermann, creator of Pretty Good Privacy encryption, has said he's not a fan of forwarding e-mails. How often would you even think of taking a handwritten letter you've received, making a photocopy, putting it in an envelope and sending it off to someone else? Zimmermann says the same thought and respect should go into forwarding e-mail.

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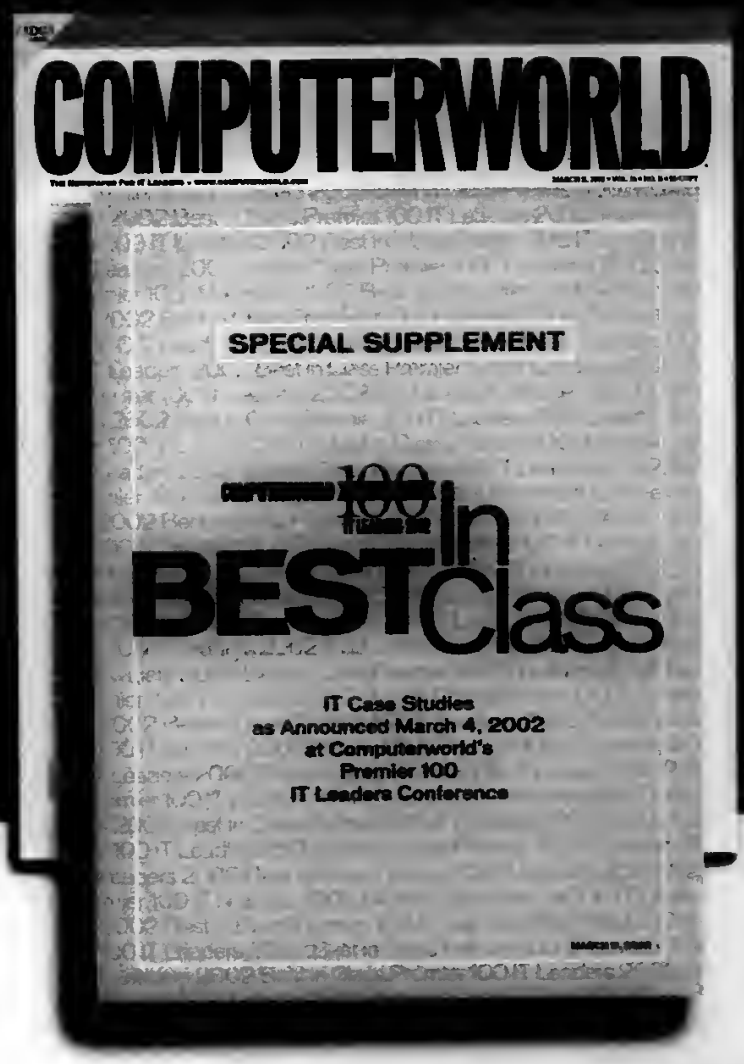

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Authentication Rollout Turns Into Control Issue

When a proposed token-based access system draws resistance, Mathias must choose among lesser options

BY MATHIAS THURMAN

ONE-TIME PASSWORDS, tokens, smart cards and public-key infrastructure are all excelleot methods for creating access-control architectures. My company is in the process of implementing a token-based infrastructure for access to our critical servers and network devices and for remote virtual private network (VPN) access into specific areas of our corporate network. The tokens are time-based, one-time password-generating products and are good at providing the two-factor authentication necessary for allowing access to critical devices.

SECURITY MANAGER'S JOURNAL

Implementing security usually carries a cost. I'm referring not to the acquisition cost, but to the planning required. Take something as simple as changing the Windows NT domain password policy. The technical procedures are straightforward: It's often a simple matter of installing a product such as San Ramon, Calif.-based Master Design & Development Inc.'s Password Bouncer or Passfilt.dll, which comes with Microsoft Corp.'s Windows NT and 2000.

Hidden Costs

However, the consequence of that policy may be an increase in help desk support calls from thousands of users who can't remember even simple passwords. Changing policy or introducing security technology often requires a considerable amount of planning. And the projects inevitably raise concerns about usability vs. productivity, convenience vs. security and risk vs. reward. The security department has to make decisions that may be perceived as impeding the company's business and operations. That's what happened in my organization, and I'm still struggling to find a solution.

We selected tokens that are time-based and that can be used only once. The system generates a oumber that's algorithmically matched to a central server. A user must enter a valid passcode, which is his personal identification number (PIN) plus the number displayed on the token. Then he must wait for the system to generate a new token number before he can authenticate again.

By default, the tokens ship with the ability to generate a new oumber every 60 seconds. This interval is acceptable for accessing a single device or perhaps for remote VPN user authentication. But in large enterprises, users often need access to multiple devices quickly.

For example, to properly troubleshoot a network problem, a user needs access to a Domain Name System server, three routers, two switcbes and one firewall — a total of seven devices. If I have configured token-based access for all those devices, the user will have to wait at least seven minutes before having simultaneous access to them.

Another drawback is the use of enterprise managemeot tools, whicb automatically log into devices for configuration, maintenance or monitoring. The management tools can't ose the tokens for authentication. It takes human intervention to read the number generated by the token and input the correct passcode. And therein lies the rub for our internal network team.

In some high-volume e-commerce businesses, a network outage can cost a company more than $10,000 per minute in lost revenue. Most of our business is conducted over the Internet, and I suspect our cost of lost business per minute is almost $5,000. But there's enough redundancy, fail-over and load balancing in our environment to ensure tbe required four nines (99.99%) of availability.

The chance of a catastrophic outage is fairly low, but I can't convince network engineers of this. In their minds, anything that impedes access to their network gear is an obstacle that could result in unnecessary downtime.

The network team feels the token time-out issue is unacceptable and is against its use in the infrastructure. I could probably convince the vice president of engineering or the CIO of the importance of the tokens and force their use. However, doing so would create friction between the security and network groups. So we have to come up with some other options.

Options and Trade-Offs

Our first idea was to enable a static password instead of a passcode. The product we're using, Bedford, Mass.-based RSA Security Inc.'s SecurID ACE Server, allows the issuance of temporary passwords when a user forgets or breaks his token and needs access. Instead of issuing another token, we just issue a new password. Another benefit is that we can embed it in the application. The problem with issuing a password, however, is that it's a departure from the two-factor authentication level of security that we get by using a token. Also, embedding a password into an application, especially a program that can reconfigure network devices, is very dangerous.

We also considered purchasing shorter 20- or 30-second tokens for the server instead of the standard 60-second ones. But that would still force users to wait before they could access another device, and it wouldn't address the enterprise management issues. Another potential problem: If the resources are in another country, the latency involved in getting packets to the devices might cause timing problems.

Another option would have been to force the use of tokens but allow the security administrator to assign a static password in cases where the engineer must access many devices in a short period of time. But since we don't have round-the-clock coverage, the amount of time it would take to get a security administrator on the phone in the middle of the night to make the configuration changes would be a problem.

Finally, we discussed scrapping the whole project and looking for an alternative. Unfortunately, we've already invested thousands of dollars in the product and support. Returning it for a refund isn't an option at this point.

So, do I force the networking guys to endure the 60-second time interval, or do I depart from two-factor authentication and assign static passwords? If you can offer a good solution, I invite you to comment in the Security Manager's Journal forum. ▶

THISWEEK'SGLOSSARY

Two-factor authentication: This authentication method requires users to provide something that they have (a token) and something that they know (a PIN). The user creates the PIN when the token is first used. Subsequent uses require the combination of the PIN and the generated number on the token.

SECURITYBOOKSHELF:

Authentication: From Passwords to Public Keys, by Richard E. Smith (Addison-Wesley Publishing Co., 2001): Few books are available on authentication, but even if there were more, I would still highly recommend this title. Smith takes complicated areas of access control and presents them in an easily understood format. Along the way, he covers not only the benefits of specific technologies, but also the drawbacks.

LINKS:

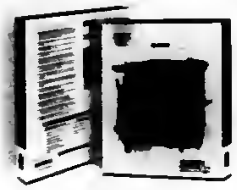
www.mdinc.com/PasswordBouncer/index.htm: Visit Master Design & Development Inc.'s Web site for information on Password Bouncer, a great tool for automating password security on Windows servers.

http://support.microsoft.com/default.aspx?scid=kb;EN-US;q281990: Microsoft's Passfilt.dll is supplied with Windows NT Service Pack 2. It allows administrators to implement a strong password policy without having to write their own filters.

Quick Link: Discuss this week's column and catch up on the latest security developments online at: www.computerworld.com/s/7c2000

■ This week's journal is written by a real security manager, "Mathias Thurman," whose name and employer have been disguised for obvious reasons. Contact him at mthurman@hushmail.com or go to the Security Manager's Journal forum.

You won't see the next network security threat coming.



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Chief Scientist
Xerox Corporation

K. Eric Drexler
Chairman
The Foresight Institute

Patrick Gelsinger
VP & CTO
Intel Corporation

Vinod Khosla
General Partner
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Chief Software Architect for HailStorm
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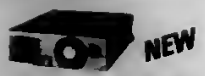

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Sexual Orientation in the IT Field

Part One

By Jennifer Hicks

IMDIVERSITY.com

In 1990, Jane Icenogle, a software engineer, put her name on a flyer announcing a meeting of the gay and lesbian employees' group at AT&T. Later, listening to her phone messages, she heard her first death threat.

"There's a wide range of reactions when you first come out at work," says Icenogle, now a distinguished member of technical staff at AT&T's spin-off, Lucent Technologies, and co-chair of EQUAL! Lucent's gay, lesbian, bisexual, and transgender (GLBT) employee group. "There's a physical hurdle in coming out, a fear you have to get over. But the benefits are worth it. Coming out has been a positive experience."

The Role of GLBT Employee Groups

Icenogle credits particular professional organizations (see sidebar) and GLBT employee affinity groups such as Lucent's EQUAL!, Xerox's Galaxe, and IBM's EAGLE as helping create the positive experience. "It makes a difference in how safe you feel at work and how comfortable you are in who you are," she says. "And with comfort, comes productivity. The more productive you are, the more you can contribute to the bottom line. Happy employees make for a good workplace."

Many of the top gay-friendly companies (see sidebar) understand this and have created their own GLBT groups as well.

"Inclusion, empowerment, and the ability to incorporate one's orientation into one's work" makes joining such groups professionally and personally rewarding, according to Sarah Siegel, program director, GLBT sales, at IBM and co-chair of the New York, New Jersey, and Connecticut branch of IBM's Employee Alliance for Gay and Lesbian Empowerment.

"Until sexual orientation and gender issues are a non-issue to everybody, there will always be a need for GLBT employee support groups," says Barbara Belmont, treasurer and office administrator of the National Organization of Gay and Lesbian Scientists and Technical Professionals (NOGLSTP). "The reality is that the workplace is an extension of family for most people," she continues, "and socializing is an important aspect of team building and productivity. Another purpose is to give collective voice and personnel leverage to the often-invisible queer."

Rachelle Caruso, an information services analyst at Intel and president of its GLBT employee organization (HLOBE), agrees. "No matter how much support there may be, there is still a large majority that does not accept or understand what it means to be gay, lesbian, bisexual, or transgender. Visibility and education are the keys to promoting diversity and acceptance. As long as there are people being 'gay-bashed' or being denied promotions due to their sexual orientation or gender identity, or employees that are fearful of being/showing who they are in the workplace, there is a need for GLBT groups, both within and outside of IT."

The Numbers

But, just how much of a need exists?

Take a look at Census 2000. Gay and lesbian families live in 99.3 percent of all counties in the United States. There were 601,209 same-sex unmarried partner households in the United States in 2000 – a 314 percent increase from 1990.

However, a report published jointly in August 2001 by the Human Rights Commission (HRC) and the Urban Institute suggests that this number still represents an undercount of the gay and lesbian population.

While the HRC indicates that gay and lesbian families may have been undercounted by as much as 62 percent, the joint report is more modest. It puts the current GLBT numbers at five percent of the total population over 18 years of age – or 10,456,405 people - many of whom are well-educated.

And then, take a look at the employee groups themselves. EAGLE has 1,000 members among 22 chapters and affiliates in 15 countries; EQUAL! doesn't keep a master list, but believes they have about 400 members in the U.S. alone; numbers from other employee groups are sparse.

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Part 2 of this article is scheduled to run on March 18, 2002. Date subject to change.

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Source: The Gay Financial Network: https://www.gfn.com and HRC's "The State of the Workplace"

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SOFTWARE ENGINEER to provide consultancy in design, analysis, development and maintenance support for Customer Information System on IBM mainframe legacy systems using CICS, COBOL II, DB2, VSAM, JCL and Easy-Trieve; provide performance review of on-line and batch application code; analysis and performance tuning of SQL used in data processing programs; and provide production call-out support. Require MS in Computer Science and three years experience in the job offered or any experience providing skills in described duties. Salary: $73,000 per year. 8 am to 5 pm, M-F. Apply with resume to: CEO, F1, Inc., 359 S. Franklin Street, Valparaiso, IN 46383-6423.

Sr Software QA Engineer needed to develop automated testing environment for testing GUI and embedded systems, write/update test plans as product evolves, diagnose/debug defects, provide expertise on test automation and Linux networking, train junior QA engineers and manage QA resources with temporal constraints. Requires Master's degree in Computer Science or Comp. Eng. plus 1 yr in job to 1 yr in software development/testing, writing/maintaining test plans, defining/executing test cases, involved in software product quality, fault monitoring and configuration management. Software development experience in automated test environment is a must. Contact Jan Ray at Anthony Digital Solutions, 391 E. Evelyn Avenue, Mountain View, CA 94041. Use Code: SWQA.

Need Sr Software Engineer to manage teams to design/develop client server/internet appls using HTML, XML, JavaScript, ASP, VB, Oracle, SQL, etc under Unix & Windows OS; lead teams in testing large complex S/W appls to automate business processes using various testing tools; interact with end clients and evaluate team members. Require MS in CS or Engineering (any branch) with 3 yrs exp or a BS or foreign equiv in any of the above with 5 yrs of relevant progressive experience in IT. Highly competitive salary. 60% traveling involved. Send resume to: InfoSmart Technologies Inc. 385 Leatherman Ct. Alpharetta, GA 30005.

Senior Database Administrators: Newton, MA office needs experienced individuals for performance monitoring, tuning and testing. Send resumes to C. Wyzga, EIS-CW02-SDBA, Eagle Investment Systems, 65 LaSalle Rd., W. Hartford, CT 06107. EOE/F/M/V/D/. Legal workers only please.

Software Engineer (St. Louis) to analyze, design, develop and implement client-server system solutions following software development life cycle processes using Object Oriented methodologies, Java, Jbuilder, JDBC, GUI, Unix, Windows NT, Oracle and SQL. Require BS (or the equivalent) in Comp. Sci., EE, Math, MIS (or in a closely related field) plus 2 yrs. related exp. Competitive salary. Send resume to Sharon Koch, 11605 Studt Ave., Ste. 120, St. Louis, MO 63141, sharon.koch@envision.com. No phone calls / EOE.

PROGRAMMER ANALYST wanted by computer consulting firm in Sugar Land, TX. Must have B.S. in Computer Science, plus 2 yrs exp. Respond by resume to Ms. S. Nelson, S/R, Digital Consulting & Software Services, One Sugar Creek Center Blvd., Suite #500, Sugar Land, TX 77478.

Sr Sys Appl Developer - Complete analyses of client's bus. reqs. for adv. appls. s/w for the oil & gas industry. Prep hi-level appls. s/w design docs. detailing all aspects of s/w coding & impl. Analyze & rev. s/w code. Test dlft bus. scenarios to ensure the s/w meets the func. reqs. Finalize s/w dev. stds. & design docs in accordance w/ test plans & existing dev. stds. Must have BS in CS, Info. Sys., EE or academic equiv. + 4 yrs. of exp. in the dev. of appls. s/w, incl. 1 yr of exp. dev. appls. s/w for the oil & gas industry. Job & interview location: Englewood, CO. Salary: $75,000/yr. Mail resumes only to: Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order # CO6012339.

Software Developer. Digl media & image hrn sks software dvlpr. Dvlp & estmte software, resrch, dsgn & test oprtng system software. Req a BS + 2 yrs exp in job offrd. Send confirmse to Appl Dvlpmnt, Index Stock Imagery, Inc., 33 W. 16th St., NY, NY 10011.

Sr Software QA Engineer needed to develop automated testing environment for testing GUI and embedded systems, write/update test plans as product evolves, diagnose/debug defects, provide expertise on test automation and Linux networking, train junior QA engineers and manage QA resources with temporal constraints. Requires Master's degree in Computer Science or Comp. Eng. plus 1 yr in job to 1 yr in software development/testing, writing/maintaining test plans, defining/executing test cases, involved in software product quality, fault monitoring and configuration management. Software development experience in automated test environment is a must. Contact Jan Ray at Anthony Digital Solutions, 391 E. Evelyn Avenue, Mountain View, CA 94041. Use Code: SWQA.

Programmer Analyst to our Cedar Rapids, Iowa location. Analysis, design, programming, project management, troubleshooting and GUI modeling for the new Enterprise System, support of related systems, and reviewing the work done by development team members. Must have Bachelor's degree in Computer Science, Engineering or related and three years experience with Java, UNIX, application servers and Object Oriented development, two years experience with VB 5.0, C, and C++, and one year experience with JSP, Apache, Tomcat and EJB. Send resume with cover letter to Cindy Corsaro, APAC Customer Services, Inc. 6 Parkway North Center, Deerfield, IL 60015. EEO/AA. APAC CUSTOMER SERVICES, INC. is not affiliated with APAC Inc., the road paving and construction materials company.

BEST Consulting seeks D/B App. Dev. for Sea/Bell area projects. DESC: Arch. dsgn. & dev. bus. intell. sys. & rel. appls. & interfaces util. RDBMS, SQL, VB, extract, transform & load tools, reporting tools, Unix & Win o/s. Dev. data models & d/b schemes. Mng. data migration & sys. integration. Travel to client sites. REQ: BS in Engr., CS, Math, or Phys. + 3 yrs. full life cycle dsgn. dev. & impl. of c/s sys., appls., interfaces, & RDBMS util. SQL, HLL, & Win o/s. 1 yr performing data migration & sys. integration. Prem. sal., benes., & bns. Pls. rep. J. King, Job# CCL-69, 11255 Kirkland Way, Kirkland, WA 98033.

PROJECT LEADER wanted by New Jersey based Co. Must have Master's degree in Comp. Sc., Engg. & 4 yrs. of exp. in Comp. S/W dev. and/or consulting and/or managing of Comp. S/W projects, teaching engg./S/W prof. and proficiency in UNIX, RDBMS, C, C++, VB, LP and dynamic programming. Respond to Magenet Solutions LLC, 1141 Green St., Iselin, NJ 08830 (Ref. RG 8082). No phone calls.

Software Dev co. req. Software Eng. w/MS & 1yr exp. or its equiv. & Prog. Analyst w/BS & 18 mos. exp. to its equiv. in toll: Visual Basic, Oracle, PowerBuilder, Sybase, Java, Unix, C++, AS/400, SQL Serv, Symon, RPG/400, Cobol, Lotus Notes, SAP, Oracle Financial, Java Script, HTML, Win NT Mapics, DB2, ASP, Corba, Win. NT, CICS, ILE RPG. Send res. to Attn: Recruiter, Allied Investment Systems, Inc., 9111 Cross Park Dr. Ste. D-200, Knoxville, TN 37923.

Chief Computer Programmer wanted in San Francisco, CA. Send resume to HR Dept., Vik Consulting, 5715 Misty Briar Ct., Sugar Land, TX 77479.

Software Engineers needed by NJ Based IT Co. - Masters Deg with 1-2 yrs Exp/Bach. With 5yr exp.

Programmer Analyst-Bach. Deg with 1-3yrs Exp to job. Exp. in skill sets incl. Windows NT, Java/Coldfusion, Unix, SQL/PL SQL, SQL Server, VB/Developer 2000, Oracle and Cobol. Optional Skills: Peoplesoft/SAP/Siebel. send 2 resumes to HRD, Accurate Software International, Inc., 4089 Plainsboro Rd, Plainsboro, NJ 08536.

Sr Project Manager in Manufacturing. Design and develop fiber optic components/products, direct/supervise engineering personnel in the testing of the optical bandwidth; integrate/develop the optical signal & cost processing applications as well as micro-resonator tunable filter manufacturing. MSEE plus min. 5 yrs exp in relevant field and min. 3 yrs exp in out-sourcing process and Asian OEM suppliers. Previous R&D project management execution exp is pref'd. Job Site & Inter: San Jose, CA. Send resume to: HR Dept, Optinix Communications, 3469 N. First St. San Jose, CA 95134. EOE.

COMPUTER SPECIALISTS - LaCie is seeking qualified Computer Specialists to serve in its subsidiary in its Hillsboro office. We are presently seeking Programmers, Programmer/Analysts, Systems Analysts and Database Analysts with experience in Cold Fusion, HTML, JavaScript, to Visual Basic. Positions require degree/experience. For immediate consideration, please send resume (no calls) to LaCie, 22985 NW Evergreen Parkway, Hillsboro, OR 97124. ATTN: HR Computer Specialist.

SAP Business Information Warehouse (BW) company seeking experienced SAP BW functional/technical consultants familiar with generic and custom extractors, data modeling, info sources and info cubes. Also seeking SEM and Supply Chain Management/APO experience. Please e-mail resume to Business Information Solutions to recruiting@bisamerica.com or fax to (858) 459-5616.

Software Engineer wanted w/2 yrs. exp. in Houston, TX. Send resume to HR Dept., Epsilon Network, Inc., 11271 Richmond Ave., Suite 106-H, Houston, TX 77082.

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We are a fast growing Consulting company based in New Jersey.
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Sun Solaris System Admins, Network Specialists, ADABAS, ORACLE, SYBASE, PROGRESS, COBOL, TCP/IP, Delphi/VB, Windows NT
Send your resume to Rod McFadden
Kama Consulting
Fax 201-934-7165
Email:Kamaco@aol.com

Dentz Development Corp. seeks Sr. Prog. Mgrs. for Seattle, WA DESC: Dev user reqs & tech specs based on analysis of exist. info sys. Dir dsgn & dev of back-up/restore prods & appls for virtual SAN & scalable sys arch, inc the sys internals & RAID tech. Dev functional & operation specs, features, & UI to facilitate comm. of data formats & trans. processes bet. new & existing sys devices & appls. Analyze & coord dev & test of new prod versions via internet & database protocols. REQS: BS in Engr., CS, Math, or Phys. + 2 yrs dsgn, dsgn & dev databases & s/w appls, util CO design & prog meth, HLL, & internet technologies. 1 yr exp dsgn & dev SAN or NAS systems prods & appls, util file sys internals & RAID tech. Competitive sal. + benes & options. Pls. Send resumes to Jobs@Dentz.com. You must include Reference #JS-102. Dentz Development Corporation, 4 Orinda Way, Building C, Orinda, CA 94563. Principals only.

Equal Opportunity Employer

Direct marketing music company is seeking a Director of Web Production to research, analyze, design, and administer websites. Bachelor's degree or equivalent required in Business Administration or Computer Science and 2 years of experience in web development and editing business content. Please mail resumes to Michele Kahne, BeMusic, Inc., 1540 Broadway, N.Y., N.Y. 10036.

Project Mngr (Oakbrook, IL) Manage projects by planning, spread, & budgeting. Provide syst that operate in cost-effective manner. Work w/clients & tech staff to resolve problems w/ s/ware. Formulate project objec tives & syst development req - ments. Prep project plans & sched, incl req ments, tasks, work assignments, resources, project milestones & review points. BS in Comp Sci/Info Tech & 5 yrs exp req'd. Exp must incl Cobol, Sybase & APT Workbench. $80,000/yr, 40 hrs/wk, 9a-5p. Applcns must show proof of legal authority to work in US. Res to IL Dept of Empl Security, 401 State St., 7 North, Chicago, IL 60605. Attn: B. Lindsey, Ref #V-IL 28431-L. An employer paid ad. NO CALLS - Send 2 copies of both res & cvr ltr.

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- a Software Business Analyst to consult with client companies to review, analyze and evaluate their business systems and write detailed description of user needs. Create technical specification and steps required developing or modifying information systems applications. Automate costing and purchase order system using MS Access, Oracle, Crystal Report and VisualBasic in a Windows NT environment. B.S. or Associates degree in Accounting, Computer Science, Engineering or related field is required.

- a Software Engineer for Design, development, implementation and testing the web-based applications allowing for online access to all the clients products and services. Manage and architect a solution that integrates the clients entire information system using JavaScript, HTML, DHTML, Java Servelets, Oracle 8i PL/SQL, JDBC ,ISP in a Unix & Windows NT environment. Master's degree in Computer Science or related field is required.

Candidate should have 2yrs of experience in job offered or 2 yrs as a Software Developer. We offer excellent salary & benefits package for 40hrs/wk, 8:00 to 5:00p.m. Send resume to: Infobahn Technologies, 463 Worcester Road # 303 Framingham, MA 01701 or hr@infobahntech.com

ForestExpress, LLC, the leading business-to-business marketplace for buying and selling forest products, currently seeks applicants for the following positions in its Atlanta, GA corporate offices: Senior Architect: bachelor's or engineering, computer science, math or related field plus seven years of hands-on application and structured system design/system integration experience including two years experience with distributed computing protocols (DCOM, CORBA and XML. Client Delivery Manager: bachelor's in computer science or engineering plus five years of relevant experience to include at least two years of ERP software project management. For consideration, please forward your resume along with a statement indicating the position you are applying for to: Forest Express, LLC, attention Human Resources, 500 Northridge Road, Ste. 400, Atlanta, GA 30350. No phone calls please. EOE

Web Integration Developer

EGI a business to business direct marketing Company has an immediate opening in our New Hartford, CT facility.

Candidate must posses a bachelor's degree in Industrial Engineering Computer Science or related field and relevant work experience, include industry experience (business to business direct marketing) and Web programming and knowledge of manufacturing process as it relates to promoted products and Web order entry.

Resume and cover letter must reflect each requirement above and specify reference code/ WID and salary requirements or the resume will be rejected.

Please forward resume to resume@executive greetings.com, or EGI 120 Industrial park Rd New Hartford, CT 06057

Website Designer/Developer Position requires: 1) Interface design 2) web/application development, and 3) web application deployment. The candidate must be able to develop the look, feel and information layout of web interfaces using a combination of business and marketing requirements and then extend the design to all pages or screens of the application Finally the developer is responsible for populating these pages with content, graphics links JavaScript, SSI files or other types of code Must have BS in Bus Admin or Multimedia Design & ability to use Flash Adobe Illustrator Fire Works, Dream Weaver & Java Script 40.0 hrs./wk 9:00 AM – 6:00 PM $46 500/Yr **Applicants send cover letter and resume to:**

Joe LeCompte
PMG NET
4470 Chamblee Dunwoody
Rd #360
Atlanta, GA 30338

SOFTWARE ENGINEER

Research, design, develop, and test computer software for business and scientific applications applying principles and techniques of computer science, engineering and mathematical analysis. Analyze software requirements for feasibility of design and hardware interface. Design and direct software system testing procedures. Coordinate requirements and development activities with local and offshore team. Use expertise in Java, J2EE, JSP EJB, Application Server Servlets, PHP Perl Reporting tools Oracle, Unix, IBM Mainframe technologies. Requirements: Bachelor's degree in computers or engineering and four years of experience as a software engineer or systems analyst. Apply: RemiSoft Solutions, Inc (HR) 11676 Perry Highway Wexford PA 15090

Software Engineer to design and implement POS (Point-of-Sale) software systems of restaurants, grocery stores, cleaners and shopping centers using Visual Basic SQL Server and COM/DCOM, to maintain and test the products with receipt printer magnetic reader bar-code scanner pole display and printer server to connect the POS client to credit card processors, to provide training, customizations and technical support to clients. Req: 1 year experience with Point of Sale applications and proficiency with Visual Basic ASP and database design. M.S. in Computer Science, field. $75k/yr 40 hrs/wk. Send resume to Mr James Chen, Estopi, Inc 1827 Powers Ferry Rd Bldg 7, Suite 100 Atlanta, Ga 30339 Ref: GA-JS

Advisory IT Specialist, Essex Junction, VT Lead developer on SAP Purchasing Deployment within division, responsible for setting priorities on business deployment using SAP & designing, testing & training various division users worldwide on using deployed SAP function, provide guidance to other developers & programming support personnel on development & deployment of SAP function; must understand SAP configuration including administration of SAP Purchasing Profiles as req'd by business initiatives. Bachelor's or equivalent foreign degree in Comp Sci, MIS, Engg, req'd, + 1 yr exp in job offer or 1 yr exp as SAP Consultant. 40 hrs/wk, 8am-6pm. $72,800/yr. Applicants should send resume to Attn Job Order No. 613525, Jobs & Training Div, VT Dept of Employment & Training, PO Box 488, Montpelier VT 05601-0488

Software Engineer

To design, develop, implement and testing of business software application using Oracle 7.0/8i, Visual basic, C++ & SQL Server. Perform Oracle database design/implementation, create front-end user interface and ability to work on Unix. Req: 2 yrs exp in job offered or 2 yrs exp as a Software Developer. Require M.S. in Comp-Sci, Engg, Management or related field. Will accept 5 years of exp in lieu of the educational and work requirements. Salary is $86,500/yr, 40 hrs/wk, 8:00 to 5:00 p.m. Send two copies of resume to Case #200017838, Labor Exchange Office, 19 Stanford St, 1st fl, Boston, MA 02114.

Senior Data Protection Analysts. Responsible for research, evaluation and implementation of sophisticated data protection tools and services. Requirements: bachelor's degree in computer science, math, MIS or related field plus 5 years of progressive experience in systems development or technical services, including 2 years in data protection plus 1 or more of the following: encryption software, firewalls, Perl, C, C++, Linux/UNIX administration and scripting, Windows NT administration and scripting, Java. Master's degree may offset 2 years of data protection experience. Positions located in Memphis, TN. Submit resume to Denise Burns, FedEx Corporate Services, 1000 FedEx Drive, Coraopolis, PA 15108

Supervisor - IT Dvlpmt. Direct & coord applic dvlpmt, rev & anal w/in IT dept. Consult w/mgmt re info & applic reqmts of Co. Consult w/dept heads to define nature of projects. Supv activities of IT dvlpmt personnel incl qlty assur personnel decisions (hire, fire, promot, perf evals, etc) & controlling expenses w/in unit. Direct training of IT employees. Supv & perform comp. applic anal, prgmg & implmtn in Oracle environt. Prep progress reports to inform mgmt of project status & dev from goals. Req: MS in comp sci, engg or related field + 3 yrs progressive exp or BS in comp sci, engg or related field + 6 yrs of progressive exp. Reqd yrs of exp must be in Oracle dvlpmt environt w/min 2 yrs exp in ORACLE Apps 10.x, PL/SQL & implmtn/support of ORACLE ERP. $77,064. Resumes to Char-Broil Div./W.C. Bradley Co., Attn: V.P. HR, PO Box 1240, Columbus, GA 31904-1240.

SYSTEMS ANALYST to provide on-site consulting in analysis, design, development and implementation of business to business and enterprise integrations of applications in manufacturing, distribution and retail industries. on AS/400 with DB2/400 and webMethods B2B server. EDI to support enterprise applications the Shop Floor tracking system (MESA) Net ERP Suite, PKMS application using DB2/400, RPG, RPGLE, COBOL with webMethods integration tools. Require B.S. in Computer Science or Electrical Engineering with two years experience in the job offered as Software Engineer. 40% travel to client sites within the United States required. Competitive salary and benefits. 40 hours/week, 8 am to 5 pm, M-F. Mail resume to: Vice President, Frontline Consulting Services, Inc. 8701 Mallard Creek Road, Charlotte, NC 28262

Telecommunication Programmer

Design, develop, implement, and administer telecommunications software for wireless systems (CDMA) and Analog communication networks (Sonet/Atm) in WIN. Advance, UNIX, AND Linux environments. Req: MS in Electrical Engineering and Wireless communications certification. Resume: HR Dept, IS COMPLETE INC. 70 East Palisades Ave Englewood, NJ 07631

Software Engineer wanted by org. in Stony Brook, NY. Reqs Master or equiv in Com Sc./Eng + 3 yrs exp. or Bach or equiv in Comp Sc/Eng + 5 yrs progressive exp w/Visual C++, VB, SQL Server Socket prgm, COM. Fax resume to HR Dept. (631) 444-6340

Sr Systems Analyst, Edison, NJ. Must have Bachelor's degree in Comp Sc Engg. Proficiency with RDBMS, Visual Basic, JavaScript, ASP. 5 yrs of exp in the job duties or Comp. Software Developing and/or Consulting. Send resume to HR Dept., Ref# GG8092, Savant Consulting Group, 505 Thornall St., Ste. 205, Edison, NJ 08837 or fax to 732-744-0135 (no phone calls please)

Software Engineer, Alpharetta, GA. Develop, design, test and document Web applications using Java, VC++, Java Script, HTML & ASP. Provide technical support req'd. Bachelors in Engg, Or Comp Sce Or Math. 6 months exp in job offered or 6 months exp in Computer Related Profession. 40 hrs/wk, Mon-Fri, $65,000.00/Yr. Interested applicants to apply in person or by sending text resumes to: North Metro Job Order #GA 7080209, 2943 N. Druid Hills Rd, Atlanta, GA 30329 or the nearest Department of Labor Field Service Office. An employer paid ad. *Must have proof of legal authority to work in the U.S.*

Software Engineer w/MS in CS, CE or related w/1 yr exp in software development to include at least 6 mos exp w/JS, SSJS, Java, Servlet, XML & SQL. May have BS w/2 yrs same exp. Will work on e-business and web dev projects for HR admin and benefits appl. Resumes to M Townsend, Employease, Inc. One Piedmont Center, Suite 500, Atlanta, GA 30305

SOFTWARE ENGINEER (2 positions) to provide in depth analysis, design, development and testing services for IT projects in SAP and Internet/Web Technologies, responsible for project scooping, project planning project time and cost schedules, quality of deliverables, study and evaluate new technologies and methodologies, provide technical and business guidance for complex user problems. Require Masters in business, computer science or engineering (any branch) with one year exp in IT. Competitive salary. Some travel/relocation required. Send Resumes to UNILINX, 4625 Alexander Drive, Suite 110, Alpharetta, GA 30022

MANAGER, Software Research & Development sought by NJ based Securities Dealer. Must possess Bachelor's degree or equivalent in Computer Science or directly related field and 5 years exp. in software/systems development and design. Respond to: Human Resources Department, Knight Trading Group, Inc., 525 Washington Blvd., Jersey City, NJ 07310.

SOFTWARE DEVELOPERS– Technology management consulting firm has opportunities for Software Developers with heavy experience in Visual Basic and SQL Server using COM architectures. Must also have working knowledge and experience using pre-release versions of VB.NET. Positions require degree plus experience. For immediate consideration, please send your resume (no calls) to: ETC, 205 Madison Ave., Room 2130, NY, NY 10165, ATTN: K. Fama.

Software Enggr to implement & support Peoplesoft, Compuron, & Clarus financial sys. Develop & customize reports using SQR, Crystal Nvision, Oracle developer on Unix, CA Unicenter environment under different database platforms. Must have 5 yrs. exp. in designing, developing & implementing financial sys. Send cv/rsme to Alan Gomes, HR Dir., J.H. Cohn, LLP, 75 Eisenhower Pkwy, Roseland, NJ 07068.

SR. APPLICATIONS ANALYST sought by NJ co engaged in comp. systems & appl dev for bank operations. Must have Bachelor's in Comp. Sci. or Comp. Engg + 2 yrs. exp. in analyzing, developing, implementing & maintaining financial info. & reporting systems for bank operations & supporting appl. for clearance & settlement of trust accounts. Respond to HR Dept. RD-1, BTM Info. Services, Inc. Harborside Financial Ctr., Plaza III, Jersey City, NJ 07311. EOE

Scientific Programmer/Analyst, Manhattan. Design and develop JSP-based web interface for updating and querying of gene expression and other biomedical research data, and design biology-oriented databases. Bach or MS degree in Comp. Sci or related field with exp. Send resume to: Ms. Mukades Tahiraj, Columbia Genome Center, 1150 St. Nicholas Ave, New York, NY 10032

Sr. Database Administrator-Williamsport, PA. Experience in design and development of applications using SQL Server, Oracle, DB2, Unix and SAP R/3. Attractive compensation package. Send resume to Supriya Palayekar: Palayekar Companies, Inc., 1959 East Third Street, Williamsport, PA 17701.

SOFTWARE ENGINEERS– Technology management consulting firm has opportunities for Software Developers with heavy experience in Visual Basic and SQL Server using COM architectures. Must also have working knowledge and experience using pre-release versions of VB.NET. Positions require degree plus experience. For immediate consideration, please send your resume (no calls) to: ETC, 205 Madison Ave., Room 2130, NY, NY 10165, ATTN: K. Fama.

Software Engineer wanted by a Telecommunications co. in Boston, MA. Must have a Bachelor's degree in Comp. Sci., M.I.S., Eng. or related field & 1 yr. exp. as a Software Engineer/Software Developer or related occupation. Exp. must include: OOA, OOD, C++, Java, GUI development, Windows Platform SDK programming, XML, Multi-thread programming, Network programming in TCP/HTTP and SQL. Please respond to Net2Phone, Inc., 200 High Street, 3rd Fl., Boston, MA 02110 Attn: Matt Eichner reference #WHC8.

Programmer Analyst. 8a-5p. 40 hrs/wk. Analyze, dsgn, prgm & implmt business applics. dvlp & maintain web applics using Java, JDK, JDBC, Applets, Swing, Servlets, RMI, C, C++, Oracle & Win NT. Bach of Sci or equiv foreign deg req'd in Comp Sci/Engg, S/ware Electrical, Electronics or related Engg. Resume to: Gainesville Masters, LLC, 1585 Monroe Dr, Gainesville, GA 30507

Project Engineer Embedded Software. Primary technical responsibility for the interpretation analysis, design and implementation of drive systems--embedded software projects. Develops software requirement concepts. Implements analysis and simulation of design concepts to determine feasibility. Develops the software architecture. Prepares computer simulations, control function diagrams, E-R diagrams and documentation. Implements the software utilizing the most cost-effective methods. Ensures system integrity through the use of appropriate software design methodologies and documentation practices. Works in a cross-functional team environment to develop and maintain drive and power conversion controls. Provides technical software support throughout the entire product development lifecycle including the design implementation, verification and validation testing, documentation, product release, and ongoing product maintenance. Directs the development and debugging of prototypes of designs. Ensures that ISO design procedures and guidelines are adhered to throughout all the phases of the development. Coordinates the activities of one or more software engineers and/or technicians on a per project basis. Required is a Bachelor of Science degree in Computer Science, Electrical Engineering, or Data Processing and six (6) years of experience in the position being offered (i.e. Project Engineer Embedded Software) or six (6) years of experience as a Software Engineer or Developer - Embedded Software. In lieu of a Bachelor of Science degree and six years of experience, the employer will accept an Associate degree in Computer Science, Electrical Engineering or Data Processing and eight (8) years of experience in the position being offered (i.e. Project Engineer Embedded Software) or eight (8) years of experience as a Software Engineer or Developer - Embedded Software. As part of the needed experience in the position being offered and the related occupation, the applicant must have had experience in designing and developing motor control/drive system software and industrial network system software for industrial automation applications; had experience with firmware design and development; had experience with C, Assembler, and C++ programming languages, and had experience with microprocessor or digital signal processor programming. Monday through Friday; 8:30 am to 5:00 pm; 40 hours per week; $70,000 annually. Qualified applicants may submit two (2) copies of resume and cover letter to: Mike Brooks, DWE FLC, PO Box 7972, Madison, Wisconsin 53707-7972. Please reference case number C102165.

ANALYST/PROJECT PROGRAMMER. Provide design, development, implementation and maintenance support for World-Wide-Web (WWW) database applications for biological and medical scientific research. Involves: WEB content development, database design and implementation, CGI and JAVA application design and implementation and application interfacing with databases (ORACLE); work with Director and project scientists to create WWW applications in conduct data collection, validation and analysis to directly support and conduct the research project, development of projects in both UNIX (SUN Solaris) and PC (Win 95 and NT) systems. Uses Perl, CGI and relational database design and implementation (ORACLE) to perform duties. Masters degree in Mathematics, Computer Science or biological sciences required; 40 hrs/wk, 3 positions available. Bioinformatics Research Center (2), General Clinical Research Center (1). Reply to, Medical College of Wisconsin, Employment Office, 8701 Watertown Plank Rd, Milwaukee WI 53226.

IT CAREER OPPORTUNITIES

CONNETICUTT
Sr Bus Anal
Sr Program Anal

DELAWARE
Comp Scientist
Supp Anal
CS Programs/Anal
Network Eng
Oracle DBA
SMTS Programs/Anal

MASSACHUSETTS
Comp Scientist
Sr App Developer
Sr Consult
Sr Oracle PL/SQL Dev

NEW JERSEY
Comp Scientist
Sr Consultant

NEW YORK
Comp Scientist

OREGON
Sr ERP Prod Specialist

TEXAS
App Consult, Graph/Ilstr
App Developer
Bus Development
IS Specialist
Lead Systems Eng
Tech Specialist
Sr Comp Scientist

WASHINGTON
ERP Prod Specialist
Sr Consult
Tech Designer

Some positions may require a BS/MS degree, relevant experience or a combination of experience and college level education may be accepted for some positions. The flexibility in travel and be on-call may be necessary. All positions involve public speaking and presentations to clients and prospective clients. Salary is DOE. Proof of legal authorization to work in the U.S. is required.

We offer excellent compensation and a comprehensive benefits package. Please forward your resume to Email cscinc@csc.com referencing IUH-CWA-202 in the subject line. Mail Anne Ann Hein, 3190 S. Grand Ave., El Segundo, CA 90245. Please indicate the specific title and location of job for which you are applying on your application letter. EOE M/F/D/V

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Systems Analyst. Duties: Resp. for testing & verifying code for assigned appls. incl. determining test require., developing & maintaining test guidelines, test cases & test scripts & coord. test sched. using Silk Test & Rational Test Studio. Conduct systems integration & functional & regression testing using Silk Radar. Manage defect reporting tools & perform tuning research using Silk Radar. Analyze, design, develop & maintain appls. using PL/SQL, Developer 2000 & Oracle Express. Requires: B.S. (or foreign equiv.) in Comp. Sci., Eng. or a related field and 2 yrs. exp. or the job offered or 2 yrs. exp. as a Prog/Analyst. Concurrent exp. must incl. 2 yrs. exp. testing & verifying code incl. determining test requirements & developing & maintaining test guidelines & 2 yrs. exp. using PL/SQL & Developer 2000. EOE. 40 hrs./wk., 8:00 a.m. to 5:00 p.m. Send resume (no calls) to: Kim Krantzman, CTG, Inc., 13220 Metcalf Ave., Ste. 140, Overland Park, KS 66213.

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Consultant. Design, develop, implement & test software applications using relational database concepts. Perform database administration. Tools: Ingres, UNIX, Openroad, Open VMS. Bachelor's in Comp. Sci. + 2 yrs exp in job offered or as Database Administrator req'd. (*We accept Bachelor's degree in any engineering field.) Prior exp. or education must include Ingres, Unix, 40 hrs/wk, 9am-5pm, $62,500/yr. Applicants must show proof of legal authority in work in the U.S. Send 2 copies of resume & cover letter to Illinois Dept. of Employment Security, 401 S. State St.-7 North, Chicago, IL 60605. Attn: Lela Jackson, Refer V-IL 30126-J. Employer Paid Ad. No calls.

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Programmer Analyst to plan, develop, test & document computer programs in client / server environment using knowledge of Power Builder, C++, Visual C++, C, Oracle 7.0/8.0, PL/SQL, & Java Script. Must have B.S. in Computer Science, Math, Engineering, or related field + 2 yrs exp. Frequent travel. $72K / year. Send Resume to HR@ VSoft Corporation, 6455 East Johns Crossing, Suite 450, Duluth, GA 30097.

SENIOR SOFTWARE ENGINEER to design, develop, test, implement, and maintain software for sophisticated computer telephone and financial applications in a client/server environment using Oracle, PL/SQL, PowerBuilder and SQR on Windows NT and UNIX operating systems. Require: Master's degree in Computer Science/Engineering, Business Administration or a closely related field with four years of experience in the job offered. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Send resume to Sherry D. Lucas, President, ABT Solutions, 8517 South Park Circle, Suite 218, Orlando, FL 32819. Attn: Job RP.

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Page number refers to page on which story begins. Company names can also be searched at **www.computerworld.com**

@STAKE INC. 82
3COM CORP. 27
3WARE INC. 44
7-ELEVEN INC. 82
AAA 1
ABERDEEN GROUP INC. 44
ABOUT INC. 8
ACCENTURE LTD. 38 44
ACUFFREE INC. 44
AGENCY HOLDING CO. 38
ALACRITECH INC. 44
AMERICAN EXPRESS CO. 82
AMERICAN INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS 10
AOL TIME WARNER INC. 38
APRIA INC. 17
ARMED FORCES COMMUNICATIONS AND ELECTRONICS ASSOCIATION 8
ASPECT SYSTEMS INC. 40
AUTOMOBILE CLUB OF SOUTHERN CALIFORNIA 1
AVANADE INC. 38
BANK OF AMERICA CORP. 7
BARTON MALOW CO. 38
BBBONLINE INC. 17
BEA SYSTEMS INC. 16,24
BELLSOUTH CORP. 24,38
BMC SOFTWARE INC. 1
BRUNHARD COUNTY CHILDREN'S SOCIETY 30
CADWALADER, WICKERSHAM & TAFT 7
CATALYST INC. 38
CDI PROFESSIONAL SERVICES 82
CDW COMPUTER CENTERS INC. 38
CHEVRONTEXACO CORP. 7
CISCO SYSTEMS INC. 44
CKE RESTAURANTS INC. 38
COMMERCE ONE INC. 21
COMPAQ COMPUTER CORP. 21
COMPUTER ASSOCIATES INTERNATIONAL INC. 1,81
COORS BREWING CO. 26
COUNCIL OF BETTER BUSINESS BUREAUS INC. 10
COVIANT INC. 10
CURRENT ANALYSIS INC. 21
DATAPHILE CONSULTING 40
DATASQUEST INC. 26
DELOITTE & TOUCHE LLP 17
DHL WORLDWIDE EXPRESS INC. 16
DOLLAR RENT A CAR SYSTEMS INC. 18
DONALDSON, LUFKIN & JENRETTE SECURITIES CORP. 7
EDWARDS THEATRES CIRCUIT INC. 39
ELECTRONIC DATA SYSTEMS CORP. 10,20
EMC CORP. 1 44
ENRON CORP. 10,25
ERNST & YOUNG INTERNATIONAL 10
ERSKINE TECHNOLOGY INC. 29
ESTEVAN GROUP INC. 17
EXPEDIA INC. 17
FBI 9
FINANCIAL SERVICES INFORMATION SHARING AND ANALYSIS CENTER 7
FIRSTENERGY CORP. 38
FIRSTENERGY SERVICE CO. 38
FOOTE PARTNERS LLC 25
FORCHT GP, CORP. 40
FORRESTER RESEARCH INC. 10,24
FRICTIONLESS COMMERCE INC. 21
FRONTIERS CORP. 10
FUEDO INC. 44
GALILEO INTERNATIONAL INC. 10
GARTNER INC. 12,14,21
GIGA INFORMATION GROUP INC. 12,14
GLOBAL CONTINUITY PLC 44
GREEN MOUNTAIN COFFEE ROASTER INC. 17
HABITAT FOR HUMANITY INTERNATIONAL 30
HALEWOOD INTERNATIONAL LTD. 46
HARRIS INTERACTIVE INC. 10
HARVARD PILGRIM HEALTH CARE INC. 18
HEWLETT-PACKARD CO. 38 40 41
I2 TECHNOLOGIES INC. 21
IBM 1,14,20,24,40,44 82
IDC 17
ILLUMINATA INC. 1
INTEL CORP. 8,21,44
INTERNET CORPORATION FOR ASSIGNED NAMES AND NUMBERS 14
INTERNET ENGINEERING TASK FORCE 43
IP COMMUNICATIONS INC. 14
J.D. EDWARDS & CO. 26
JP MORGAN CHASE & CO. 38
JABIL CIRCUIT INC. 21
JELLY BELLY CANDY CO. 17
JUPITER MEDIA METRIX INC. 10
KETCHUM 38
KEYCORP 14
LAND ROVER NORTH AMERICA INC. 35
LAVA TRADING INC. 6
LE MERIDIEN HOTELS AND RESORTS 26
LEFTHAND NETWORKS INC. 40
LEHMAN BROTHERS HOLDINGS INC. 7
LIGHTPOINTE COMMUNICATIONS INC. 7
LINCOLN WATER SYSTEM 8
LOUDCLOUD INC. 17
LUCENT TECHNOLOGIES INC. 9
MANDRAKESOFT INC. 44
MANUFACTICS GROUP INC. 33
MARRIOTT INTERNATIONAL INC. 30
MASTER DESIGN & DEVELOPMENT INC. 82
MATSUSHITA ELECTRIC CORPORATION OF AMERICA 17
MAYTOR CORP. 40
MAZDA NORTH AMERICAN OPERATIONS 38
MCKINSEY & CO. 38
MELLON FINANCIAL CORP. 1
MERRILL LYNCH & CO. 7
META GROUP INC. 1,14
MICRO FOCUS INTERNATIONAL LTD. 18
MICROSOFT CORP. 17 18 34,38,39,40,50
MORGAN STANLEY DEAN WITTER & CO. 7
MYERS-INDUSTRIES INC. 17
NATIONAL INFRASTRUCTURE PROTECTION CENTER 7,8
NETWORK APPLIANCE INC. 40,41
NEW YORK CITY PARTNERSHIP 8
NEW YORK ELECTRONIC CRIMES TASK FORCE 7
NEW YORK POWER AUTHORITY 17
NISHAN SYSTEMS INC. 44
NORTEL NETWORKS CORP. 38
NOVELL INC. 18
NPOWER NH 6
NRG ENERGY INC. 44
OMNI HOTELS 82
OMNICOM GROUP INC. 38
ONYX SOFTWARE CORP. 10
OPTIONEXPRESS INC. 82
ORACLE CORP. 12,14,21,38,38,39,40,41
OTUM LLC 21
PALM INC. 21
PANASONIC CO. 17
PARTICPA IP SYSTEMS INC. 44
PEOPLESOFT INC. 12,24,28,30
PEROT SYSTEMS CORP. 38
PICTURETEL CORP. 38
PIRUS NETWORKS 44
PIVOTAL CORP. 17
PLUMTREE SOFTWARE INC. 24,28
PRICEWATERHOUSECOOPERS 10
PRIVACY & AMERICAN BUSINESS 10
PROCTER & GAMBLE CO. 17
PROFESSIONAL ASSOCIATION OF CONTRACT EMPLOYEES 17
QUANTUM CORP. 40
RED HAT INC. 17
REED ART CENTRAL 8,24
ROYAL APPLIANCE MANUFACTURING CO. 17
ROYAL CARIBBEAN CRUISES LTD. 38
RSA SECURITY INC. 82
SALLIE MAE INC. 1
SAN JOSE WATER CO. 8
SAP AG 12,21,24,40
SAPIENT CORP. 21
SCIENT INC. 17
SEATTLE PUBLIC UTILITIES 8
SECURITIES INDUSTRY ASSOCIATION 7
SEEBEYOND TECHNOLOGY CORP. 24
SIEBEL SYSTEMS INC. 12,24
SOCIETY FOR INFORMATION MANAGEMENT 17
STORAGE NETWORKING INDUSTRY ASSOCIATION 44
SUN MICROSYSTEMS INC. 10,14,39
TACTICAL STRATEGY GROUP INC. 1
TEK TOOLS INC. 44
TESORO PETROLEUM CORP. 42
THE BETTER BUSINESS BUREAU OF METROPOLITAN NEW YORK 6
THE CONFERENCE BOARD INC. 27
THE GALLUP ORGANIZATION 10
THE MITRE CORP. 82
THE NEW YORK SOFTWARE INDUSTRY ASSOCIATION 28
THE NEW YORK TIMES CO. 10,14
THE REYNOLDS AND REYNOLDS CO. 17
THE SENDER STAFF 15
THRIFTY RENT-A-CAR SYSTEM INC. 38
TIBCO SOFTWARE INC. 38
TOSHIBA AMERICA BUSINESS SOLUTIONS INC. 18
TRICORD SYSTEMS INC. 40
TRIPLEHOP TECHNOLOGIES INC. 8
TRUSTE 10
U.S. DEPARTMENT OF COMMERCE 44
U.S. DEPARTMENT OF JUSTICE 10,12
U.S. GENERAL ACCOUNTING OFFICE 10
U.S. MARINE CORPS. 82
U.S. SECRET SERVICE 7
UNITED AIR LINES INC. 14
UNITED TELECOM COUNCIL 8
VERITAS SOFTWARE CORP. 40
VERIZON COMMUNICATIONS 7,8
VITRIA TECHNOLOGY INC. 24
VMWARE INC. 44
WESTIN HOTELS & RESORTS 38
WILLIAMS COMMUNICATIONS GROUP INC. 21
WORK FRIENDLY SOLUTIONS (WORKPLACE SAFETY AND INSURANCE BOARD OF ONTARIO) 7
WORLDCOM INC. 6
W-TECHNOLOGIES INC. 8
XEROX CORP. 24
YAHOO INC. 38

ADVERTISERS INDEX

AT&T www.att.com/ 11
Avaya www.avaya.com 4
Cisco www.cisco.com 17
Compaq Computer Corp. www.compaq.com 22-23
Computer Associates www.ca.com 16 19
Directions 2002 www.idc.com/events 43
Harris pro.STAIonline.com 51
Hewlett-Packard www.hp.com 63, 32-33
IBM Software www.ibm.com 47
IBM Tivoli www.ibm.com 45
Infoworld CTO Forum www.ctoforum.infoworld.com 52
InterSystems Corp. www.intersystems.com 64
Microsoft Certified Partner www.microsoft.com 20
NTT Communications www.ntt.com/ww 15
Phoenix Technologies www.phnx.com 26
Premier 100 Best in Class www.computerworld.com 45
Princeton Softech www.marketwatch.com 35
Salesforce.com www.salesforce.com 9
Storage Networking World www.computerworld.com/snw 37
Sun Microsystems www.sun.com 2-3
Veritas www.veritas.com 13

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Continued from page 1

Kumar

ways been a number of technology announcements at CA World, but this year you'll find that we'll also have a lot to do with the customer. We have our current crop of customer surveys being wrapped up; we're going to talk about them more openly with our customers. We have absolutely focused on the customer being No. 1. I have said clearly, it will make or break careers in our company. We have not used those words before.

To what do you attribute CA's long tradition of having combative relationships with its customers? What does it stem from? No. 1, from acquisitions. They have been a great thing, and they have also been a thing that has introduced its fair share of contention. Why? You're the end user. You bought [a product from a CA competitor]. One weekend, two guys did a deal, and the next thing you know, the product that you chose over the other guy's is now owned by the other guy. Huge problems.

No. 2, we clearly have had a long-standing policy of restructuring the acquired company immediately. We have taken the big-bang approach — we cut upfront, and [we're] done. We have never had a second cut in any acquisition. But, let's face it, in one day, there are hundreds of people who have left the company. Some don't have nice things to say about you; some go to work for competitors. Competitors hire them en masse to create a force to compete against CA. That's how Legent [Corp.] was created. And Legent went around and said, "We're the alternative." Well, it didn't work out that way, [and CA acquired Legent]. That wasn't a hostile deal. It was a friendly deal — they wanted out. Platinum [Technology International Inc., which CA also acquired] was the same way — they were in trouble.

Platinum was an interesting case, because some Platinum customers had it written into their contracts that they would be paid up to three times the value of their contracts if Platinum was ever acquired by CA. And we didn't pay a single person — not a single one. The reason is, every customer has come to us and said that's not the basis on which they want to do business. [For] one of them, the amount was over $75 million. Admittedly, we've had a few discussions. Not every one has been an easy thing.

What, in your view, is the concern that these companies had about an acquisition by CA in the first place? It's the momentum that people create. You have Legent going out and saying, "CA buys the products, they milk them, they don't enhance them, they fire everybody." Platinum comes in and says, "We're the alternative to CA, we're kinder, we're gentler, we're different." It's the perception you paint in the marketplace. And let's face it, we were not very savvy and not very smooth in how we dealt with the press and with the market.

The other dark side that people don't talk about — take, for example, Platinum. Platinum had technology they were selling for which there were no software developers working on them. Platinum had layoffs, and Legent had some cuts before we bought them — they've all had some cuts. The products were frozen. So we pick them up, we publish a nice little white paper because everybody wants to know what's happening. I point out in the white paper that the product ain't going anywhere. And people go, "That son of a bitch." This is what happens. That's a tough hurdle.

Have you learned any more about the recently initiated federal investigations into CA's changes to its financial reporting practices since you informed the news media on Feb. 22 that you were unaware of the details of those investigations? We have had some dialogue with the [Securities and Exchange Commission] and the U.S. attorney's office. I'm being mindful of their need to do whatever they're going to do. But I will tell you that whatever they have going on is very preliminary. We still have not been asked for any information. The issues I think they're interested in have been issues that have been the subject of many newspaper articles over time. Our job is to work with these folks, to help them understand what the issues are, and I believe they'll go away and we'll be vindicated. Customers have been very supportive.

How difficult has this year been for you, having dealt with the proxy fight to unseat your board of directors last summer and now all of this? The proxy fight was a very difficult time for me personally, but it was a time where we had to get out and communicate more. It forced us to do things that we historically hadn't done before. We generally have not been big to get out and communicate with people, and the proxy forced us to do it. So, while it was a difficult experience and a difficult time, I think we learned a lot from it and we came out stronger.

This will do the same for us. There's a lot of anger in the company about being poked and prodded right now. As a management team, we're working on channeling that anger to delivering strong results. ◗

Quick Link For the complete version of our Q&A with CA's Kumar, visit our Web site: www.computerworld.com/s/t/27580

Continued from page 1

CA World

Users face ever-increasing complexity with the proliferation of storage technologies such as storage-area networks and the new high-speed InfiniBand connectivity standard, according to Russell Artzt, a CA co-founder and executive vice president who's now in charge of the BrightStor storage line. The new BrightStor portal will help users manage heterogeneous storage protocols (such as Fibre Channel and SCSI), processes and vendor hardware in their enterprises, Artzt said.

Sanjay Kumar, CA's president and CEO, said the effort was user-driven. "Customers want to look at storage not as MVS storage or Unix storage or [Windows] NT storage; they want to look at storage as storage," Kumar said. "Large customers said they wanted us to pull these products together and allow them to have one view of storage, which we had done in enterprise management, so it's a natural thing for us. We almost fell into it."

Rather than make users navigate multiple screens to do things like access data on the performance of individual devices or applications, CA plans to allow them to manage and monitor their storage resources centrally through its customizable BrightStor portal. Users will be able to perform tasks such as checking into backup operations run by CA's or other vendors' applications or viewing the health of IBM or EMC Corp. storage hardware.

In the same vein, CA will also announce at CA World in Orlando April 21-25 a security management portal, said Simon Perry, vice president of security solutions at CA. The portal will let users manage their intrusion-detection, antivirus, policy compliance and other Web-based security applications from one point, said Perry.

Several users expressed interest in both products. Without having seen the portal, Jeff Rhoads, manager of enterprise systems management at Sallie Mae Inc. in Reston, Va., suggested that it could be just the thing to simplify administration, which he said accounts for 60% of the workload for his IT security personnel.

Currently, just adding a user to the Sallie Mae network requires accessing about a dozen security applications for things like password activation. Sallie Mae's objective is to build "an interface where one system can control all that access," Rhoads said.

CA isn't alone. IBM's Tivoli division said it already offers portal products for access management and to coordinate security-related data generated from antivirus, intrusion-detection and other applications.

It particularly behooves CA to offer a single interface to manage the various storage products it has acquired over the years, said James Governor, an analyst at Illuminata Inc. in Nashua, N.H. Companies can't keep building new front ends as they add storage and security applications, said Governor, and the portal gives them a simple way of adding software without rebuilding the interface. Moreover, with the growing complexity of storage networks, storage managers need to have their own dedicated management tools, just as enterprise network software managers do, he said.

Governor suggested that one sticking point with the security portal may be that companies may not want any one individual to have central control of the security network. "I'm not sure the market is ready for that, but it's great the tools are there," he said. ◗

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FRANK HAYES/FRANKLY SPEAKING

Best Practice? Nope

LET'S SAY YOU SPOT A HOUSE THAT'S ON FIRE, and you call the fire department. How long should it take the fire department to answer the phone? A few seconds? A minute? Or suppose you find a ticking bomb and call the police. How long should you have to wait on hold before you can report it? A minute? Two? Five?

How about a week?

Late last month, two security researchers proposed that when a software vendor is informed of a security hole, the vendor should have seven days just to acknowledge being notified. Not to fix it or discuss it — just to say, "I got your message."

And then, according to the "best practices" proposal submitted to the Internet Engineering Task Force (IETF), the vendor should fix the problem within 30 days — that is, unless the vendor gets a "grace period extension" from the person reporting the problem.

Let's translate that into plain English: According to these best practices, vendors can spend a week pretending they haven't heard anything about a problem and then as much extra time beyond 30 days as they can get by arm-twisting, cajoling, browbeating or threatening whoever reported the problem.

Sure, that person can always go public with the information — and risk being stomped into a greasy spot on the pavement by a platoon of the vendor's lawyers.

Best practice? It sure sounds good for vendors — but not for anyone else.

Steve Christey of The Mitre Corp. and Chris Wysopal of @stake Inc. should know better. They're certainly not naive. Their proposal spells out the varying motives and options that both vendors and bug reporters may have (read it yourself at *www.ietf.org/internet-drafts/draft-christey-wysopal-vuln-disclosure-00.txt*).

So why give vendors a week just to check their mail? Especially considering that Wysopal's own company, @stake, has a policy on dealing with security holes that gives vendors just two business days to respond and two weeks to fix the problem?

Maybe Christey and Wysopal thought they needed a looser policy to make it more palatable as an IETF standard.

If that's what they were thinking, they weren't thinking it through.

A best practices document from the IETF won't be treated as the lower limit of what a vendor *should* do. It will be treated as the upper limit of what a vendor is *required* to do. That means this standard should be as tough as possible — not watered down

Even then, a best practices standard can't be used to force a vendor to do anything. But it *can* be pointed to by a vendor's lawyers if they claim that a bug-finder damaged the vendor's business by going public instead of granting endless extensions.

So because the IETF is a recognized standards body, a lame set of so-called best practices actually gives vendors one more thing to hide behind if they want to drag their feet and dodge responsibility or even threaten the people who find bugs.

If that's what this best practices standard does, we're better off without it.

Too many software vendors already treat a security hole mainly as a public relations problem. They dodge, they deny, they delay — and all the while, IT people are the ones facing the consequences.

Frank Hayes, Computerworld's senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

We need vendors to treat a security hole like a burning house or a time bomb that could go off at any second. In other words, like a real threat.

But that will only happen because of real pressure from customers and security experts and, yes, organizations like the IETF.

So if the IETF wants to define how to deal with security holes, let's just be sure it's lighting a fire under the people who should fix them — and not letting the house burn down.

SHARK TANK

INSTALL program for this piece of company software isn't working properly, so pilot fish calls the help desk. "Model number?" tech asks. IBM Model 6887, says fish. "I don't know what a 6887 is," says tech. "Well, on the front it says, 'IBM Personal Computer 750,' " fish reports. "Sorry, we can't help you with a personal computer; this number is only for support of company computers." Click!

WHEN NETWORK communications fail between this big construction project in the Caribbean and engineering company's stateside headquarters, stateside boss screams at on-site pilot fish to find the problem and fix it, now! After days of troubleshooting with island's telecommunications providers, fish locates the point of failure: "Stateside headquarters is incommunicado," he reports, "because *its* equipment is under four feet of water from a flood."

GENERAL FAILURE error message flashes each time user at this remote office turns on his PC, so support pilot fish asks him to send it back to headquarters. But only the monitor arrives. Fish calls and asks, Why didn't you send the CPU? Says user, "Well, the monitor was the only one showing the error."

AFTER A failed security audit, IT consultant pilot fish is going over the results with a senior systems manager. "Using 'norman1' as a password would be a bad idea," fish points out. "It's like using your date of birth for your bank card PIN." Replies manager, "What's wrong with that?"

JOB INTERVIEW with a contract IT outfit goes well for this pilot fish – but then she hears from the outraged people whose names she gave as references, all of whom were contacted by the prospective employer. "They used my name as a hook," fish says, "and then tried to sell them services!"

I won't sell you out. **sharky@computerworld.com.** You score a snazzy Shark shirt if your true tale of IT life sees print – or if it shows up in the daily feed at *computerworld.com/sharky*.

The 5th Wave

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Here are three-hundred-eighty-nine-thousand-four-hundred and thirty-four reasons why you'll thank HP for building the Superdome server.

That's the number of transactions per minute it recorded, according to the latest TPC-C benchmark results. You'll appreciate how much more productive you can be with a UNIX® server that's 76% faster than IBM's highest published non-clustered TPC-C result. That's fast enough to satisfy even your most demanding IT manager. And your CFO will relish Superdome's price/performance ratio of $21.24 per transaction.

HP's Superdome server will have you handling more applications, not only faster, but more reliably. It's designed with your always-on Internet infrastructure in mind, so you'll be working on multiple projects, across multiple platforms, with ease. Superdome is equipped to handle the Intel® Itanium™ processor architecture, which HP co-developed. This breakthrough technology blends high volume with high performance, and it will keep you poised for seamless upgrades. We could give you a million more reasons. But why take our word for it? Check the Top 500 Supercomputer Site list.

Infrastructure: it starts with you.

Find out how Superdome is helping Amazon.com dramatically increase their performance. Visit www.hp.com/large/superdome for your copy of The HP Superdome Advantage resource guide. Or call 1-800-HP-ASK-ME

invent

HP's TPC-C benchmark of 389,434 transactions per minute was achieved on a 64-way PA 8700 Superdome running Oracle9i Database. As an OLTP system benchmark, TPC-C simulates a complete environment and is modeled after actual production applications and environments rather than stand-alone computer tests which don't evaluate key performance factors (for example, disk I/Os, data storage, backup and recovery user interface, and communications). Price performance of $21.24/tpmC. TPC-C is a copyright of the Transaction Processing Performance Council. Further TPC-C information is available from http://www.tpc.org. IBM's TPC-C result, available 4/13/2001, is 220,807 transactions per minute running on a IBM P680 running Oracle 8i, with price performance of $34.18/tpmC. Oracle is a registered trademark. Oracle8i and Oracle9i are trademarks or registered trademarks of Oracle Corporation. Itanium is a trademark of Intel Corporation. UNIX is a registered trademark of The Open Group. Amazon.com is a trademark or registered trademark of Amazon.com, Inc. Total system availability data, May 15, 2002, hardware available now. Limit one HP Superdome Advantage resource guide per customer. Allow 6 to 8 weeks for delivery. ©2002 Hewlett-Packard Company. All rights reserved.

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